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Back cover: Volunteers and local residents planting wild flowers at Millennium Bridge, a flagship 'buzzing site' for York Urban Buzz (see pp134-136). Photo: *Alice Farr*

The Naturalist

The shrinking violet *Viola stagnina* in the Thorne area of Yorkshire

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Introduction

During research of the plants of the Thorne Moors area I came across records of Fen Violet *Viola stagnina* (Plate 1, centre pages). I wondered why this plant seems to have disappeared from the area and what conditions were required for its former presence. The Thorne records are presented below in chronological order. The area now referred to as Thorne Moors has also been called Thorne Waste. Fen Violet has been known as *Viola stagnina* or *Viola persicifolia* at various times in the past.

At the present time Fen Violet is known from three localities in England - Wicken Fen and Woodwalton Fen in Cambridgeshire and Otmoor in Oxfordshire - and several in Ireland. The Cambridgeshire sites are peat fens and the Oxfordshire site is a meadow on clay soil. The flowers of Fen Violet appear in May and June. In addition to the 'normal' (chasmogamous) flowers, small, self-fertile (cleistogamous) flowers are produced later in the year and can also set seed in great abundance (On-line Atlas of the British and Irish Flora).

Records of Fen Violet in the Thorne Moors Area

- F.A. Lees (1888) reports "I am informed by my friend James Backhouse, that the Thorne Moor violet (Flora page 15) may probably belong to this species. It merits further investigation" and quotes Baker & Nowell (1854) "I think not, although I have never myself seen it there *in situ*: a scrappy specimen Joseph Blackburn of Leeds gave me, as gathered there, was certainly either *eu-canina* Bab. or the intermediate form of *lactea* Watson discriminated – in my opinion the former. I consider it very unlikely indeed that the true *stagnina* occurs."

- Rev. T. Owston found it between Misson and Misterton c.1840. The specimen is in Lincoln Museum Herbarium; verified by Mr W.H. Beeby (Carr, 1906).

- It was next found in a dyke near Oatland Farm, Gringley Carr (Carr, 1909).

It is listed for Askern and Thorne in a copy of Butcher & Strudwick (1930) page 53, annotated by Dr J.M. Taylor and signed 1942. The Askern plants were destroyed soon after their discovery there by drainage operations (Colin Howes, pers. comm.). Dr Taylor was a Thorne GP and, along with Dr S.P. Rowlands, a Doncaster GP, he recorded plants in the Thorne area.

Dr Taylor also annotated a copy of Druce (1932): *V. persicifolia* = *stagnina* Thorne Moors. Near Shirley Pool, Askern (C. Howes, pers. comm.).

On 8 June 1942, A.A. Dallman, Dr J.M. Taylor and Dr S.P. Rowlands found "a couple of hundred or more plants within a restricted range in a somewhat sheltered situation of southern aspect skirting the bank of a dyke" at Hatfield Moor (within ten miles of Thorne Waste). Specimens forwarded to Kew were confirmed as *V. stagnina* (*V. persicifolia* Roth.). Another visit on 9 July 1942 found specimens with ripe fruit and others which had distributed seeds. "There were many seedlings in different stages of development on the slope and lower part of the dyke" (Dallman 1942). Taylor (1943) reported from Thorne: "Stimulated by the discovery of *V. stagnina* near Doncaster as reported by Mr A.A. Dallman, we decided to try to discover the violet gathered by Joseph Blackburn of Leeds over 50 years ago and discussed by Dr F.A. Lees 1888 (*loc. cit.*). Many expeditions were made and the more promising parts of the extensive borders of Thorne Moors were gone over. About the middle of August 1942 we at last came across a patch of violets at the New Zealand area of the moors. Specimens were sent to Kew and to Dr Sledge at the University, Leeds. Kew reported that the violet was *V. stagnina* Kit. and Dr Sledge said there was little doubt about the identification as *V. stagnina* but withheld a final decision until the summer of 1943. The violets were growing in a shallow peaty hollow which probably holds water in winter. They spread up the sides of the hollow and overflow on to the more level ground around. There were several hundred plants. The soil was peat of an acid nature, overlying sand."

In a copy of Lees (*loc. cit.*) annotated by Dr Taylor: "bushy thicket near New Zealand" (C. Howes, pers. comm.).

W.A. Sledge (1943): "In my report presented to the Botanical Section of the Yorkshire Naturalists' Union last October and published in the January number of *The Naturalist* (1943) I recorded the finding of this violet by Dr Taylor at Thorne Moor. The discovery was made – in company with Dr S P Rowlands - in mid-August when the plants were past flowering but bore numerous capsules with ripening seeds. When the first specimens were sent to me as *V. stagnina* I was doubtful of the identification, thinking that it might be one of the luxuriant fen forms of *V. canina*. The subsequent receipt of an entire plant showing the slender under-ground soboles left no doubt as to the correctness of the diagnosis. Specimens forwarded by Dr Taylor to Kew were also agreed to as *V. stagnina*.

"On June 6th (1943) in company with Dr Taylor, I had the pleasure of seeing this rare plant in flower. If any doubts had remained as to its identity the round almost spurless and nearly white flowers would at once have dispelled them. It was growing in open *Salix atrocinerea* carr woodland on fen peat. Associated species were --*Stellaria glauca* With., *Vicia cracca* L., *Spiraea ulmaria* L., *Potentilla erecta* (L) Hampe, *P. palustris* (L)

Scop., *Galium palustre* L., *Succisa pratensis* Moench, *Rumex acetosa* L., *Luzula multiflora* (Retz) Lej., *Carex goodenowii* Gay., *C. curta* Good, *Calamagrostis canescens* (Wigg) Gmel, *Ophioglossum vulgatum* L. Of these plants the *Galium* and the *Calamagrostis* were the most plentiful. The violet is limited to an area of about 12 sq. yds. within which it is plentiful. Possible ground for other colonies has been assiduously searched for by Dr Taylor without success. The continued existence of the plant here is unfortunately imperilled by agricultural operations. Already the land has been ploughed to within a stone's throw of the site.

"The concluding sentence of Lees' remarks in the Flora is surprising. So far from considering it 'very unlikely indeed that the true *stagnina* occurs' one might have expected precisely the opposite deduction. The ecology of the area renders it far more likely to produce *V. stagnina* than *V. lactea* which is a plant of dry heaths. A locality in which *Lathyrus palustris* and *Peucedanum palustre* still maintain a somewhat precarious existence (both of them were collected there by Lees in 1872); where *Calamagrostis canescens* is the dominant grass and where *Osmunda* and *Lastrea cristata* both grew in Lees' days has clearly got the closest resemblance to the fenland vegetation in which *Viola stagnina* finds the conditions ideal for its growth.

"Where this violet and *Viola canina* grow together hybrids usually abound. At Woodwalton Fen I experienced great difficulty in finding pure *V. stagnina* among the innumerable hybrid forms which grow there so freely. In Oxfordshire *V. stagnina* has not been seen for many years in its single recorded station, though *V. stagnina x canina* hybrids are still to be found there. Not the least interesting aspect of this discovery therefore is the fact that here the pure species occurs without any admixture of *canina*, although that species grows not many yards away. The explanation of the apparent absence of hybrids here - they are certainly few in numbers if they occur at all - would seem to be the different times of flowering of the two species in this locality. On June 6th not a single flower remained on the *V. canina*; the *V. stagnina* on the other hand was only just beginning to bloom. Two plants only had open flowers, the rest were only in bud or still showed no signs of flower production. Free flowering therefore probably does not occur before the end of June or early July."

Sledge (1950): "Some years ago the late Dr J.M. Taylor rediscovered *V. stagnina* in peaty, scrub-covered land on the margin of Thorne Moor (see *The Naturalist*, 1943, 77-78). The same year it was also found in a second locality near Askern but was destroyed soon after its discovery there by drainage operations. During and since the war the ever-increasing areas brought under cultivation led to the clearance and ploughing up of ground near to the station for the violet and when I revisited the locality last June it was clear that unless arrangements could be made for the acquisition of the land, the plant would soon be destroyed. The matter was reported to and taken up by the Yorkshire Naturalists' Trust but it proved impossible to come to an arrangement with the farmer either for the purchase of the land or for the halting of further clearance and ploughing. By the time these words are in print, therefore, one of the very few surviving British localities for this plant will have been converted into a potato field. When efforts to secure its preservation had failed some sods were removed to the nearest suitable ground not scheduled for clearance."

- Sledge (1953): “In the report for 1949 (*The Naturalist*, 1950, 33) I recorded the failure of attempts made to prevent the clearance of carr-wood on the margin of Thorne Moor, where *V. stagnina* flourished. On revisiting this area in July with Mr G. A. Nelson, we found that a small area, which included the part where the violet grows, had been left undisturbed and the plant continues to flourish there. We were unable to find any of the plants which we tried to preserve by removal to adjacent ground three years ago.”

- A specimen of *V. stagnina* collected at Thorne by G.A. Nelson on 1 June 1949 exists in the Leeds Museums and Galleries. The record only says Thorne Waste (Clare Brown, Leeds Museums and Galleries, pers. comm.).

- Howitt & Howitt (1963): “Between Misson and Newington, Mrs Sandwith. The plant was flourishing in the station in 1952 but by 1956 the field had been ploughed and re-seeded. It may still survive on the headland.”

- Mention is made in the YNU Excursion circular no. 608 of a trip to the Bawtry area on 22 July 1962. It is thought that this station has been destroyed by sand quarrying (C. Howes, *pers. comm*.).

- There are two specimens of Fen Violet in Doncaster Museum Herbarium, collected by William Bunting of Thorne in July 1964: one from a drain on the moor edge at Lindholme, Hatfield, was determined as Fen Violet by D.H. Valentine on 15 February 1982; the other, from Thorne Waste, as a hybrid between Heath Dog-violet (probably ssp. *montana*) and Fen Violet. See Plate 1, centre pages.

- M.J. Harvey, a student of King's College, the Newcastle branch of the University of Durham (1962) remembers “first, the plants I used in the experiments were those already being grown by Prof. Valentine when I turned up on the doorstep in September 1958. The ones I collected were much later when I was familiar with the species and they were not included in the hybridisation experiments so far as I remember. The *Viola stagnina* at Medge Hall station I have only faint memories of. I presume that it was growing on the edge of the drain near the station. By then I had a 1947 Austin and would drive along the roads looking for suitable habitats for *Dactylorhiza* and violets. The Bawtry site was shown to me by Dr Sledge and possibly someone else. This was the only time I met Sledge who was well known. I drove to Bawtry and met him and probably we all drove in his car. The site was a mile or so away and consisted of a field of grass no different from any other, so far as I could see, but it was very well populated with plants of *V. stagnina* growing interlaced with the grass. A year or so later I tried to re-find the place but could not, there were no distinguishing landmarks I could remember. It must have been in the Misson region in a field draining into the Idle watershed.” (M.J. Harvey, pers. comm.).

- Plants judged to be Fen Violet were seen growing on the edge of one of the 'peat canals' on Thorne Moors (SE 7115) in 1975 by W. Bunting, C.J. Devlin and C.A. Howes. Plants were growing with Marsh Pennywort *Hydrocotyle vulgaris,* Marsh Cinquefoil

Potentilla palustris, small-reeds and Common Cottongrass *Eriophorum angustifolium* (C. Howes, pers. comm.).

The Institute for Terrestial Ecology investigated historical records for Fen Violet. The plant was recorded in three areas of the Humberside Levels in Nottinghamshire and South West Yorkshire, including SSSIs at Thorne and Hatfield Wastes. In 1994 these sites were visited (Wells *et al.,* 1995) to search for the plant to assess whether suitable habitat remained. No Fen Violets were found, although a few areas with potential for supporting small populations were discovered. Its apparent demise was attributed to various causes:

- ploughing of grassland and conversion to arable land;
- competition from more vigorous vegetation;
- water level too high or too low;
- removal and neglect of ditches;
- eutrophication caused by fertiliser run-off (Palmer, 2006).

Three sites for Fen Violet on Thorne Moors have recently been given by different people. These sites have been searched and are not suitable habitats for it. One is flooded, a second is too dry and is covered by Bracken *Pteridium aquilinum* and the third, visited by Tim Pankhurst of Plantlife and Camilla Lambrick of the Ashmolean Natural History Society of Oxfordshire, is considered unsuitable.

The Thorne site discovered by Drs Taylor and Rowlands in 1942 was visited in 2015. The area is now cultivated fields and a drain. No violet plants were seen, although the drain side was searched. Looking at maps dating back to the time of the discovery, one can chart the land change, from scrub to agriculture. There was a duck decoy in the area, shown on the OS 6" map published in 1908 (Old Maps Online). This may be the area referred to by Dr Taylor as a shallow peaty hollow.

There now seems little chance of Fen Violet remaining in the Thorne Moors area. Land use change and habitat loss have probably meant that the conditions required for this rare plant have altered beyond recovery. Having said that, it is thought that seeds of Fen Violet are long-lived and there are instances where ground disturbance has resulted in a re-appearance of the violet at an established site (Palmer, *op. cit.*).

Conclusion

The trail of Fen Violet in the Thorne area seems to end in 1975. Although the records suggest this, the story is not so clear. The sample of Fen Violet gathered at Thorne by William Bunting and given to Doncaster Museum in 1964, was said by Professor Valentine in 1982 to be a hybrid. The herbarium sheet with Bunting's specimen of Fen Violet from Thorne Waste is annotated "in dyke on moor edge". The exact locality is not given. Whether the specimen was collected from the original site found by Drs Taylor and Rowlands is unclear. No published records of Fen Violet growing on the site now known as Thorne Moors have been found apart from the 1975 record. The site found by Drs Taylor and Rowlands is south of the moors. Thorne Moors/Waste may have been regarded as a larger area in the past, although the maps show that the boundary in the 1940s was the same as at present. Bunting may have used the Thorne Waste locality as the nearest point of reference. Sledge said that Heath Dog-violet

grew not many yards away. He also said that the apparent absence of hybrids would seem to be due to the different time of flowering of the two violets in this locality. It could be that in a later year the conditions were favourable for both to be in flower at the same time. This would not account for Prof. Valentine's decision that the Thorne plant was probably a hybrid between Fen Violet and Heath Dog-violet; the latter is also a rare plant. Perhaps Dr Sledge did not identify the Heath Dog-violet to a sub-species. Was Prof. Valentine mistaken in his identification of the herbarium specimen? It was 18 years after the donation of the plant, although someone who was familiar with the Violaceae would be unlikely to make a mistake. Another possibility is that plants were translocated to the 1975 site for safety and were either already hybrids or became hybridised at that station. If the latter, it seems unlikely that they would be hybridised with a rare sub-species of Heath Dog-violet.

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The Bloody-nosed Beetle *Timarcha tenebricosa* in North Yorkshire: distribution and estimates of population size

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Introduction

Leaf-beetles in the genus *Timarcha* (Chrysomelidae) comprise some 100 species and approximately 50 subspecies and show a curious world distribution, occurring around the Mediterranean and in north-western North America (Jolivet, Poinar & Verma, 2014). In the British Isles there are just two species, the Bloody-nosed Beetle *Timarcha tenebricosa* (Fabricius, 1775) and the Small Bloody-nosed Beetle *T. goettingensis* (Linnaeus, 1758), both with largely southern distributions. The common names refer to the beetles' ability to exude bright red, distasteful haemolymph from the mouth if roughly handled.

The Bloody-nosed Beetle is a large beetle (c.20mm) with a violet-black body and elytra permanently fused together (Cox, 2004). With dispersal by flight thus precluded, its distribution will reflect local displacement by walking. Longer-distance movements could also be by walking, given a continuum of suitable habitats and sufficient time, or more likely *via* external transport agents, which include humans. The life-cycle is such that both eggs and adults overwinter (Chevin, 1985). Thus in spring, developing larvae are present at the same time as actively mating adults.

Figure 1. The distribution of hectads with *T. tenebricosa* in the British Isles.

In the British Isles, the beetle's distribution is widespread across most of central and southern England and Wales, with many records from the Atlantic and Irish Sea coasts. North of the Humber populations are entirely confined to the coastlines of Lancashire, Cumbria and south-west Scotland but with one record apparently from the Dunfermline area (NBN, 2015a; Figure 1[1], arrowed – see Discussion). Small Bloody-nosed Beetle is smaller (c.11mm) but is otherwise very similar in appearance and could potentially be confused with Bloody-nosed Beetle. It has a central and eastern distribution in England and is uncommon but widespread in Yorkshire, but not further north (NBN, 2015b).

The YNU database contains 13 records for Bloody-nosed Beetle from 10 locations (Table 1, Figure 2), mostly in VC63 (South-West Yorkshire). Only eight records are dated and these were collected between 1879 and 1900, with the exception of one from Collingham near Wetherby (VC64, Mid-West Yorkshire) in 1915. Two further VC64

[1] Grid map sourced from the NBN Gateway, accessed 8 December 2015. (The data providers and NBN Trust bear no responsibility for the further analysis or interpretation of this material).

records (undated) came from Knaresborough and Thorpe Arch. The single record for Yorkshire shown on the current NBN map for Bloody-nosed Beetle (NBN, 2015a; Figure 1) was from near Bessacarr, Doncaster, in 1883 (presumably the same as one of the Sandall Beat records – Table 1). Thus, it seems that this insect may not have been recorded in Yorkshire for the best part of a century.

SW discovered what he thought was Bloody-nosed Beetle in 1987 in East Tanfield quarry (SE283791) to the south of Nosterfield in VC65 (North-West Yorkshire) (Yellow star on Plate 2, centre pages). Despite subsequent sightings of both adults and larvae, particularly within Nosterfield Nature Reserve (SE278798), it was only recently that the species identification was unambiguously confirmed (Oxford, Oxford & Warwick, 2013). Here we report data on the fine-scale distributions of this beetle around Nosterfield and the food plants on which adults and larvae were found. Mapping the boundaries of the Nosterfield population may provide some indication of the origin and history of the beetle in this area. We also carried out mark-release-resighting studies on adult beetles in 2014 and 2015 to (a) try to obtain a crude estimate of the population size in one semi-isolated section of its range, and (b), calibrate, approximately, what proportion of the population is seen during visual surveys in order to inform future monitoring.

Methods

Mapping

Adult beetles and their unmistakable larvae were sought along road and track edges across a roughly 5.6 km^2 area (convex polygon) centred, approximately, on the village of Nosterfield (SE277804) (Plate 2, centre pages). Surveys were conducted from 2013 to 2015 inclusive and between mid-April, when overwintering adults are active and mating, and mid-June, when larvae from overwintering eggs are in their final or penultimate instars and, therefore, most easily seen. Different areas were searched in different years. Fortuitous sightings at other times were also logged and mapped. For the formal surveys, sections of vegetation were slowly scanned by eye and the position of an adult or larva recorded with a Garmin *eTrex* H GPS unit. For each adult record the sex and whether a singleton or a mating pair were recorded. Most adults observed were wandering and so not associated with a particular food plant. For larvae, however, the substrate they were on was always noted. Most surveys took place on warm dry days when adults were most likely to be active and visible.

Areas were calculated with the planimeter at http://acme.com/planimeter/. The proximity of the Yorkshire Bloody-nosed Beetle records to Magnesian Limestone deposits was estimated by converting the map references given in Table 1 to postcodes, using Street Map (http://www.streetmap.co.uk/) and then entering these in the Geology of Britain viewer (2015). Distances to the nearest limestone strata were measured on the screen with a ruler at the magnification showing a scale line of 1km (Table 1).

Table 1. Historical records for Bloody-nosed Beetle in Yorkshire from the YNU database. The column headed Limestone gives the straight-line distance to the nearest Magnesian Limestone strata (see text).

Location	Grid ref	Limestone (km)	Sample Date	Sample Recorders
Ackworth	SE4416	3.6	Unknown	A.R. Heath
Collingham	SE3846	0	1915	J.D. Firth
Conisbrough (vague site)	SK5298	0	Unknown	E.B. W.
Doncaster (vague site)	SE5703	1.2	Unknown	E.G. Bayford
Ferrybridge	SE4824	0.5	1894	Joseph Neale
Knaresborough	SE3557	0	Unknown	W.C. Hey
Knottingley	SE4923	0	1898	W.J. Fordham
Pontefract	SE4623	0	1879	E.B. W.
Sandall Beat - sensu lato	SE6103	3.7	1883	W.C. Hey
Sandall Beat - sensu lato	SE6103	3.7	May 1883	YNU Report (in *The Naturalist*)
Sandall Beat - sensu lato	SE6103	3.7	May 1883	Anon
Sandall Beat - sensu lato	SE6103	3.7	1900	E.G. Bayford
Thorpe Arch	SE4345	0	Unknown	R. Cook

Mark-release-resight (MRR) technique

The MRR technique, ideally, requires a closed population unaffected by immigration and/or emigration. An area on the north-eastern boundary of Nosterfield Nature Reserve was chosen (black ellipse; Plate 2, centre pages) as it is relatively isolated from the small number of beetles recorded in Nosterfield village to the north-west and from those occupying the green lane to the south east. The population along the track leading deeper into the Reserve was not identified (despite several years of observation) until early 2015, but is anyway isolated by 100m or so of apparently beetle-free terrain. A decision was made not to include the relatively small number of beetles found on the Camp Wood (henge) side of the minor road leading to Nosterfield village.

On 23 April 2014, the area was surveyed between approximately 10.00 and 13.00hrs by GO and RO. All beetles seen were GPS-located, scored for sex and marked on each elytron with a silver UniPaint pen 0.8-1.2mm (Mitsubishi Pencil Co. Ltd.), a paint that dries almost instantly (Plate 2, centre pages). Beetles *in copula* were carefully marked without separating them, with females painted with two marks on the thorax as the elytra were obscured by the male. Three days later (27 April) the same habitat was resurveyed and all beetles seen were GPS-located and scored for sex and the presence of marks. In a repeat exercise in 2015, when the surveys were conducted by GO, RO and Jonnie Fisk, beetles were marked on 26 April and resurveyed on 29 April. The marks were not unique and so the movement of individual beetles between marking and resighting could not be quantified.

Marking and resighting were each carried out only once during 2014 and 2015 and so estimates of population size have to rely on a crude Lincoln Index method (Southwood &

Henderson, 2000) rather than more sophisticated techniques that are applicable when marking and resighting are conducted several times over a short interval. If n_1 individuals, out of an unknown total population size N, are sampled and marked on the first occasion, and m marked individuals are found in a sample size of n_2 on the second occasion, the estimated population size $N = (n_1 * n_2)/m$. However, when sample sizes are small and $n_2 + m < N$ the results can be heavily biased. Bailey's correction, $N = [n_1 * (n_2+1)]/(m + 1)$, reduces this bias (Southwood & Henderson, 2000) and has been used here.

Two by two contingency χ^2 tables, and the combining of information from them using the $\sqrt{(\chi^2)}$ method (Everitt, 1992), were performed in an Excel spreadsheet.

Results

Regional mapping

The past records of Bloody-nosed Beetle in Yorkshire are shown in Table 1 and Figure 2. It must be stressed that the historical locations are often rather vague and so the 1km square map references in Table 1 may not be accurate. Geographically, the records fall in a relatively narrow band running SSE to NNW across the county which seems to follow the line of the Zechstein geological formation, marine limestones laid down in the Late Permian comprising the Cadeby and Brotherton strata (Geology of Britain viewer, 2015). These are usually referred to as Magnesian Limestones. Of the 11 sites with Bloody-nosed Beetle records, seven (including Nosterfield) are located on the Magnesian Limestone and the other four are within 3.7km (Table 1) and possibly still within its influence. Given the relatively small area of the Magnesian Limestone outcrop compared with the area of Yorkshire as a whole, this can hardly be coincidental.

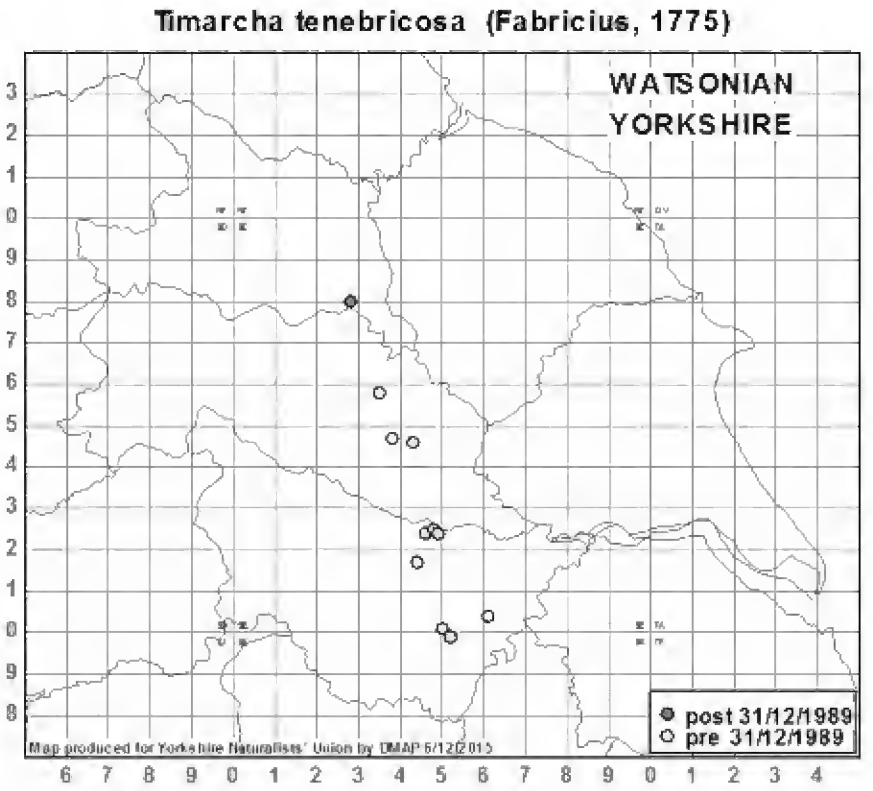

Figure 2. Map showing the distributions of known Yorkshire records for *Timarcha tenebricosa* based on data held by the YNU. The Nosterfield population is shown in grey. The map was produced by Bob Marsh using Alan Morton's DMAP program.

Mapping the Nosterfield population

The map in Plate 2 (centre pages) shows the linear features examined for signs of beetles without success (blue dotted lines) and the observed locations of beetles sighted during the surveys and by casual observers. Beetles were found within an area of some 1.6 km^2 (convex polygon) almost confined to the triangle described by the villages of Nosterfield, West Tanfield and Thornborough.

The larvae at Nosterfield were associated with two food plants, Cleavers *Galium aparine* and Crosswort *Cruciata laevipes* (Oxford, Oxford & Warwick, 2013) but were occasionally found

sitting or wandering on other vegetation such as Ivy *Hedera helix*, avens *Geum* sp. and various grasses. The two food plants are largely confined to road verges and the edges of green lanes although their presence or absence depends on local management. For example, along the severely managed verges of the road leading from Nosterfield Nature Reserve north-east to the B6263 the food plants were all but absent. Likewise the remnants of a green lane, now a narrow track through arable fields, to the west of Thornborough village were totally unsuitable for the beetle. Apart from these areas and the centres of villages, most of the other linear transects had abundant Cleavers and Crosswort and so, in general, the beetle's distribution seems not to be limited by that of its food plants. Given the linear distribution of the food plants it might not be appropriate to estimate an area of beetle presence. So far Bloody-nosed Beetle has been recorded along c.2.8km of, not always contiguous, margins.

Population size estimates

Data on marked and resighted beetles in the two years are given in Table 2. All resighted beetles had retained both marks, suggesting permanence at least over the three days of the study. Estimates were calculated for all individuals and for males and females separately. However, the small sample sizes mean that the estimates are sensitive to very slight changes in numbers.

Table 2. Numbers of beetles marked and resighted, and estimated population sizes for males (M), females (F) and ignoring sex (ALL), in 2014 and 2015. The symbols in parentheses are those used in the equation in the text. * Population sizes calculated using the Bailey correction (see text).

2014	**ALL**	**M**	**F**	
Total marked (n_1)	57	28	29	
Total marks resighted (m)	14	10	4	
Total seen on 2nd date (n_2)	67	30	37	
Estimated population size (N)*	**258**	**79**	**220**	**299**
2015	**ALL**	**M**	**F**	
Total marked (n_1)	51	34	17	
Total marks resighted (m)	21	16	5	
Total seen on 2nd date (n_2)	51	30	21	
Estimated population size (N)*	**121**	**62**	**62**	**124**

In 2014 the estimated population size, ignoring sex, was 258. Population sizes calculated for males and females separately were 79 and 220 which, summed, give a figure of 299, some 16% higher than the estimate based on total numbers. The separate male and female estimates are less reliable because numbers are, necessarily, smaller and more subject to stochastic influences. For example, if five rather than four marked females had been seen during the re-survey, the female population estimate would have been 184 and the combined male and female figure 263, very close to the 258 when sex is ignored. The proportion of marked males resighted (10/28, 36%) was higher than for females (4/29, 14%) although not significantly so ($\chi^2_{(1)}$ = 2.248). If the overall population size estimate of 258 is taken as the

most accurate figure then on the first day 22% of the population was seen (57/258), and on the second day 26% (67/258). So, on average, approximately one quarter of the population present was visible during the surveys.

In 2015 the estimated population size overall was lower at 121 and the separate estimates for males and females, respectively, 62 and 62. The total of the separate-sex estimates, 124, matches almost exactly the overall estimate. Resighted individuals comprised 47% (16/34) of marked males and 29% (5/17) of marked females; these are not significantly different ($\chi^2_{(1)}$ = 0.636). On both days 42% of the population was seen (51/121).

Discussion

The Nosterfield population of Bloody-nosed Beetle seems to represent the species' most northerly outpost on the eastern side of Britain. The NBN record attributed to the Dunfermline area (NT0891; Figure 1, arrow) was actually collected at Plas Doly-y-Moc, which is near Maentwrog in North Wales (c.SH6841). The latter seems a much more likely location. Although the beetle has been recorded in Yorkshire before (Table 1), all dated records suggest that it has not been present for many decades and, even then, may have represented occasional imports rather than self-sustaining populations. It is also possible that some of the recorders confused Small Bloody-nosed Beetle for Bloody-nosed Beetle, although the former tends to occur on acid upland soils.

The coincidence between the locations of past (and present) beetle records in Yorkshire and areas of Magnesian Limestone is striking (Table 1, Figure 2). One link between the two is likely to be the presence of the beetle's food plants. In Britain, bloody-nosed beetles tend to feed on bedstraws, especially Hedge Bedstraw G*alium mollugo* and Lady's Bedstraw *G. verum* but also on Cleavers and Crosswort. With the exception of Cleavers, the others are all mostly associated with calcareous substrates (Blamey *et al.*, 2003). Tetrads with Hedge Bedstraw, in particular, tend to track the Magnesian Limestone across central Yorkshire (Online Atlas of the British and Irish Flora, 2015). Cleavers thrives on highly fertile soils (Blamey *et al.*, *loc. cit.*) and in Yorkshire is widespread in a variety of habitats (Online Atlas of the British and Irish Flora, *loc. cit.*). So, three of the main food plants favour calcareous areas, but it may not be their presence alone that is important. For a beetle with low dispersal powers, the density and spatial distribution of food-plant patches are also key to their survival. It might be that food plants are not only more likely to occur on the Magnesian Limestone, but that plants grow more densely within patches, and that these patches occur closer together.

It is unlikely that Bloody-nosed Beetle has only been introduced to sites in Yorkshire on or near the Magnesian Limestone. However, beetles accidentally seeded into such habitats may thrive for sufficient time to be discovered and recorded by entomologists, whereas those introduced elsewhere die out before their presence is noted. If it really is the case that strong food-plant preferences are established early in the larval stage (see below) then the survival of, say, a gravid female introduced to a new site would depend on the presence of its preferred food plant. This likelihood is enhanced in calcareous areas, such as the Magnesian Limestone. In this context, it is surprising that populations have not been recorded on the

Yorkshire Wolds, where all four food plants are widely distributed (Online Atlas of the British and Irish Flora, *loc. cit.*).

The Bloody-nosed Beetle was probably accidentally introduced to Nosterfield by humans, given the lack of nearby source populations and its very limited innate dispersal capabilities. It is just possible that this population, and others historically recorded in Yorkshire, are remnants of a once more widespread distribution. We note that VC65 is a relatively under-recorded vice-county. However, the limited area over which the beetle is found and the much more widespread occurrence of its food plants in the Nosterfield area are more consistent with an introduction. The first sighting (1987) was in a disused quarry. While we are not suggesting that this was necessarily the first population to be established in the area, limestone quarrying is a major industry in this part of North Yorkshire and movement of lorries or other machinery provides a possible distribution mechanism for the beetle. The overwintering eggs of Bloody-nosed Beetle are laid in a protective coating of regurgitated food and faeces and are stuck to a substrate (Selman, 1994) or deposited on the ground (Jolivet *et al.*, 2014). In this way they could readily be transported. If the beetle is dispersed as a result of quarrying, then the greater activity and scale of the operations on the Magnesian Limestone (Anon, 2012) than on the chalk Wolds may provide a possible explanation for why beetles are found on the former but not the latter.

It is not clear when the Bloody-nosed Beetle was introduced to the Nosterfield area and whether its range is continuing to expand: critical historical records are absent. In 2009-2010, an invertebrate survey of Nosterfield Nature Reserve failed to find the beetle (Hammond, 2011). However, that survey was focussed mainly on wetland and grassland habitats with very limited sampling of the reserve margins and so it would be unwise to assume the beetle was absent from the Reserve at that time (Martin Hammond, pers. comm.)

During the current surveys, the substrate on which larvae were found was noted. Cleavers is a food plant often mentioned in connection with *Timarcha* (e.g. Chevin, 1994; Jolivet *et al.*, 2014) but Crosswort less so. As noted above, the staple diet of many Bloody-nosed Beetle populations comprises various bedstraws but these are largely absent from the Nosterfield area. It is not possible to gauge whether one of the local food plants is preferred over the other without information on their relative densities. The two are often in close proximity and here larvae are frequently found on both plants. Preliminary experiments by RO with captive adult beetles suggest that moving them from the plant they were found on to the other food plant is not always successful and it is possible that specific preferences are established at the larval stage. Nonetheless, both food plants are widespread in the area and do not seem to be a limiting factor determining beetle distributions. As Bloody-nosed Beetle is flightless then local dispersal is entirely by walking. To what extent beetles are willing to cross terrain lacking food plants and how far they can move in a generation have, as far as we are aware, not been studied. It is certainly the case that beetles are occasionally crushed by vehicles on the road between the Reserve and the northern henge (Plate 2, centre pages), but just how much a few metres of tarmac represents an impediment to dispersal is unknown. Information on movement and what features constitute barriers may enable a very crude estimate of the age of the Nosterfield population to be made, assuming a single time and site of introduction and a constant rate of expansion.

The MRR technique makes several assumptions, including the random mixing of marked and unmarked individuals between the two survey periods and equivalent survival rates for marked and unmarked cohorts of beetles. In the latter context, to what extent might marking a dull, black beetle with silver paint increase its vulnerability to predation? Jolivet (2008) and Jolivet *et al*. (*loc. cit.*) note that Bloody-nosed Beetle is practically immune to predation with protection provided by the release of extremely toxic blood when disturbed and a very strongly armoured abdomen, a result of robust elytra fused with a mortise and tenon joint. Indeed, these authors suggest that the beetle is aposematically (warningly) coloured, being black against a green background. So, although we have no evidence one way or the other, differential predation on marked and unmarked individuals over a three-day period seems unlikely.

The MRR exercise suggests that the population size of beetles in the relatively isolated area of Nosterfield Nature Reserve studied is in the low hundreds. The estimate of 258 in 2014 was roughly double that in 2015 although, with the method used, no confidence intervals can be placed around these figures: they are likely to be wide. The reasons for the difference between years, if significant, are not obvious. It was certainly much colder in late April 2015 than in 2014 although the total numbers of beetles caught on each survey date were not markedly dissimilar. In any case, the population-size estimates rely on proportions rather than absolute sample sizes when marked and resighted. If these estimates can be extrapolated to the entire linear distribution of Bloody-nosed Beetle so far mapped, they suggest a total population size of 1740 in 2014 and 820 in 2015. These extrapolations make many assumptions, of course, but indicate that there may be between 1000 and 2000 beetles in the entire Nosterfield area. To what extent sub-populations are isolated from one another requires knowledge of local movement patterns and, ultimately, examination of the population structure using molecular markers.

In both years the proportion of marked beetles resighted was greater for males than for females, although in neither case was the difference significant. Combining the probabilities did not support a significant trend ($Z = 1.62$, $P = 0.10$). However, a bias in this direction is not unexpected. The life cycle of Bloody-nosed Beetle is complicated (Chevin, 1985, 1994) and both mating and egg laying take place in late April. A proportion of marked females might, therefore, spend time under vegetation while laying eggs whereas males are constantly wandering in search of mates and hence may be more readily seen.

Finally, one of the aims of the MMR study was to determine what proportion of the estimated population size was visible during a standard walk-through survey. In 2014 this was approximately 25% and in 2015 approximately 40%. Within a year, the estimates were similar on both survey days. Taken overall, it suggests that, very roughly, about one third of the population is seen at any one time. This is useful for future monitoring of the Nosterfield Nature Reserve population and will enable trends in numbers to be relatively easily tracked over time. Jolivet *et al*. (*loc. cit.*) point out that *Timarcha* species worldwide are in decline, victims of urbanisation, pesticides, habitat loss and, although they do not list it, almost certainly habitat fragmentation. Bloody-nosed Beetle now contributes towards the biodiversity of Yorkshire's beetles and the fine-scale distribution, dispersal and feeding biology of the Nosterfield population would repay further study.

Acknowledgements

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Note on ship-based sightings of Cetaceans off the Yorkshire coast

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MARINElife is a UK-based charity established to coordinate and develop a growing portfolio of global cetacean and seabird research and monitoring projects. Since 2005 it has co-ordinated a growing number of ship-based monthly censuses, including routes across both the Irish Sea and North Sea. Working closely with commercial shipping lines, the methodology developed for MARINElife's Biscay Dolphin Research Programme is used, i.e. two volunteer researchers (usually a cetacean specialist and a seabird specialist) observe from the bridge of the ship.

An agreement was reached with DFDS Seaways in 2010 to put a team on its roll-on roll-off freight service between Rosyth in Scotland and Zeebrugge in Belgium. The route of this ship follows the UK coastline as far south as Norfolk before making the short crossing to Belgium. The timings of this service usually mean that the ship passes the full length of the Yorkshire coastline in daylight, on both its outward and return journeys. It has not been possible to conduct this survey every month but nevertheless a total of 25 surveys (outward and return) has been conducted between April 2010 and November 2014. The route is still being regularly surveyed and MARINElife has kindly made the data collected up to the end of 2014 available for analysis for this note.

The Rosyth-Zeebrugge freight ferry is a large vessel and, whilst the route it follows is more or less fixed, some small deviations inevitably take place to take in account tide and weather conditions. The route rarely comes closer than 20km to the coast and this note includes all those sightings recorded less than 100km (54 nautical miles) from the Yorkshire coastline.

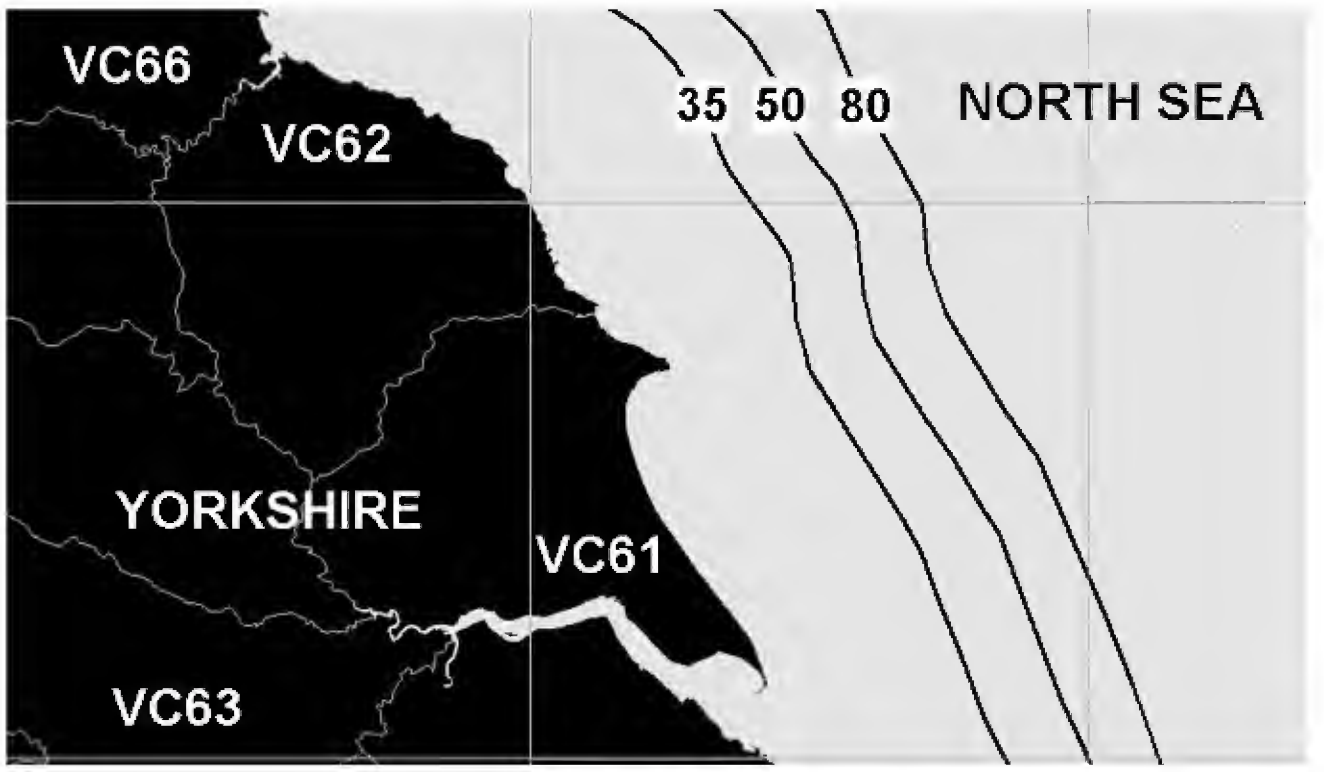

Fig. 1. Vice-counties of the Yorkshire coastline showing distance bands in km. (Courtesy of Terry M. Whitaker)

Cetaceans were sighted on 19 of the 25 surveys undertaken to Zeebrugge and back, of which 9 sightings (47%) occurred off the Yorkshire coastline. As mentioned above, the ship's schedule usually allowed for daylight sightings along the whole of the Yorkshire coast, which was not the case for other areas. The relatively high percentage rate of 47% should therefore be treated with caution. In total, the surveys recorded a total of 68 cetaceans comprising 42 Harbour Porpoise, 16 White-beaked Dolphin, 3 Northern Minke Whale, 2 Short-beaked Common Dolphin and 5 unidentified dolphins.

Table 1. MARINELIFE Rosyth–Zeebrugge surveys 2010-2014 showing all cetacean sightings off the Yorkshire coastline.

Species	Date	No. Seen	Nearest land	Distance Km	Vice County
Harbour Porpoise *Phocoena phocoena*	18/01/2011	1	Bridlington	70	61
	13/03/2011	1	Whitby	32	62
	14/06/2011	1	Whitby	28	62
	19/10/2012	1	Whitby	28	62
	19/10/2012	1	Robin Hood's Bay	26	62
	19/10/2012	3	Scarborough	17	62
	11/04/2013	1	Flamborough Head	12	61
	11/04/2013	1	Whitby	28	62
	11/04/2013	1	Scarborough	16	62
	14/06/2013	3	Spurn	25	61
	14/06/2013	3	Whitby	22	62
	14/06/2013	2	Scarborough	13	62
	15/06/2013	2	Spurn	26	61
	09/08/2013	3	Flamborough Head	18	61
	09/08/2013	2	Flamborough Head	23	61
	09/08/2013	3	Spurn	25	61
	09/08/2013	4	Whitby	16	62
	14/03/2014	3	Spurn	25	61
	12/09/2014	5	Whitby	33	62
	12/09/2014	1	Scarborough	14	62
White-beaked Dolphin *Lagenorhynchus albirostris*	14/06/2013	13	Whitby	57	62
	12/09/2014	3	Whitby	30	62
Short-beaked Common Dolphin *Delphinus delphis*	12/09/2014	1	Withernsea	24	61
	12/09/2014	1	Whitby	25	62
Northern Minke Whale *Balaenoptera acutorostrata*	14/06/2013	1	Ravenscar	13	62
	09/08/2013	1	Scarborough	12	62
	12/09/2014	1	Whitby	28	62
Unidentified Dolphin	14/06/2011	4	Robin Hood's Bay	22	62
	12/09/2014	1	Whitby	24	62

Table 1 shows the total number of cetaceans recorded including date, nearest point of land, distance to land in kilometres and the relevant vice-county. Although there has been at least one survey in every calendar month in the period 2010-2014, only Harbour Porpoise has been recorded in the area outside the June-September period. Short-beaked Common Dolphin was only recorded in the area on the September 2014 survey (though It has since been recorded 26km off Bridlington in February 2016 – pers. obs.).

Table 2. Distribution of sightings by distance from shore.

Species	Band 1 20-34 km	Band 2 35-49 km	Band 3 50-64 km	Band 4 65-79 km	Band 5 80+ km
Harbour Porpoise	15	17	9	1	0
White-beaked Dolphin	0	0	3	0	13
Short-beaked Common Dolphin	0	2	0	0	0
Northern Minke Whale	2	0	1	0	0
Unidentified dolphin	0	5	0	0	0
TOTAL	***17***	***28***	***10***	***0***	***13***

Table 2 shows the sightings by species and distance from shore. The distance is broken down into 5 bands. As no sightings were made closer than 20km, this is used as the base distance. It can be seen that, as expected, observations of Harbour Porpoise are mainly in Bands 1 and 2 (20-34km and 35-49km). In contrast, White-beaked Dolphin was only observed in bands 3 and 5 with the highest number beyond 80km. The three sightings of Northern Minke Whale were in the Bands 1 and 3 (20-34km and 50-64 km). The two observations of Short-beaked Common Dolphin were both in Band 2 (20-29 nautical miles).

In addition to the Rosyth-Zeebrugge survey, MARINElife also organises monthly surveys from Immingham and Hull across the North Sea and is always keen to recruit new volunteer researchers. If you are competent at identification at sea of either seabirds or cetaceans and would be interested in joining the team, details can be found at http://www.marine-life.org.uk/ .

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The genus *Campsicnemus* in Yorkshire

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Campsicnemus (Haliday in Walker, 1851) flies are tiny, many being no more than 2.5mm in length and some are shorter than that. They are handsome insects and some males have conspicuously enlarged and contorted legs, which often bear striking arrangements of bristles or even strap-like adornments that are thought to be used in display. It could be speculated that the bristles at least may have a raptorial function in securing prey but females lack these characters. Most *Campsicnemus*are associated with moist places such as ditches, wet peat and the margins of water bodies. They are probably predatory in both larval and adult stages. There are c.230 species currently recorded world-wide, with a 'guesstimate' of 300-400 species in all. Thirteen are recorded in Britain, of which the following nine are reported from Yorkshire.

C. alpinus (Hal.), as its name suggests, occurs in the uplands and it is widespread across the Pennine and North York Moors where it is a regular component of the peat-bog dolichopodid fauna. Along with its congeners, it also occurs on lowland peat in places such as Thorne Moors and Strensall Common.

C. armatus (Zett.) is mainly coastal in distribution, being first reported in the County from Spurn in 1953. Inland it occurs at sites along the Humber bank as far up-river as Blacktoft Sands. It has also been reported in 1983 from Moorends bordering Thorne Moors.

C. compeditus Lw. is recorded from only three upland peat bogs in Yorkshire: Thieves Moss, Austwick, in 1983; Sug Marsh, Timble, in 1985; and Tarn Fen and Tarn Moss, Malham, in 1993. All records are the author's; several examples of both sexes were found at each place.

C. curvipes (Fall.) is one of the most common and widespread dolichopodids, with reports lacking only from traditionally under-recorded areas in Yorkshire. Unlike the three previous species there appears to be no clear macro-habitat association. Recorded dates of occurrence range between 2 March 1920 and 26 December 1921 (!) – both extremes were reported by Chris Cheetham, possibly the greatest of that hardy generation of Yorkshire Naturalists' Union members who laid the foundation of present Diptera recording in the County!

C. loripes (Hal.) is common across Yorkshire, with records from as far apart as Spurn and Whernside, but there are extensive areas of the County from which it is currently unrecorded, especially in VC61 and lowland parts of VC63. It is a regular member of the suite of moorland dolichopodids in both the Pennines and North York Moors, but it is not restricted to moorland habitats.

C. magius (Lw.) is the only Yorkshire member of the genus to have a national threat status (Lower Risk/Near Threatened = RDB3). Mainly recorded from coastal marshes in south-east England, a population existed between 1976 and 1983 in the vicinity of a brackish drain near the base of Moorends colliery spoil-heap on the western boundary of Thorne Moors. Some

years ago I revisited the general area, but it had changed out of recognition and no trace of the fly was found. Descendants of the original population may still survive, but this is a very difficult fly to catch for identification because it rests on the water or flies just above the surface. See Plate 3, centre pages.

C. marginatus Lw. The first Yorkshire record was in September 1984 when a specimen was found on the bank of the River Wharfe in Otley. Since then it has been recorded at other riparian sites, usually with areas of shingle, in the north of the County, including coastal streamsides at Hayburn Wyke and Mulgrave Woods, Sandsend. In addition, specimens have been found at former sand and gravel quarries: Hay-a-Park (Knaresborough), Nosterfield, and most unexpectedly, North Cave Wetlands in the lowlands of East Yorkshire. It was discovered there in August and September 2007 but, in spite of much subsequent collecting at the site, no more have been found. Present records suggest that this is a late summer insect occurring from July to mid-October.

C. picticornis (Zett.) is one of the tiniest of the genus with even the largest specimens measuring less than 2mm, but it is a pretty fly when examined under the microscope and readily distinguished by the reddish basal antennal segments. First recorded in Yorkshire by the late Dr Peter Skidmore at Sandal Beat fen in June 1981, it has since been found at about twenty localities, most of them being lowland wetland sites. There appears to be a well-established population in the south-east corner of Island Lake at North Cave Wetlands YWT reserve. There are two reported Pennine locations: Timble Ings (Otley) and the river bank at Low Row in Swaledale, but none from VC62, including well-worked North York Moors sites.

C. scambus (Fall.) is one of the larger and more distinctive *Campsicnemus*, the males having extraordinarily enlarged middle tibiae. The earliest County record is from Skipwith Common in September 1921, where it still occurs, often in quantity: it has a long flight period, specimens being found from March through to October and probably longer than that if sought. Although widespread and often common, distribution in Yorkshire is patchy and there are large areas from which there are no records. For example, there are no reports from the coastal areas of VC61 and much of Holdernesss, and only one from the western part of VC63 (Broadhead Clough).

There is considerable variation in the leg colouration of both *C. curvipes* and *C. scambus,* even within the same populations. In some individuals (of both sexes) the legs are clear orange, whilst those of others are very dark brown, and there are intermediates. This feature seems to be quite random, but I mention it as a possible area for future investigation for an aspiring dipterist to tackle. Likewise, the precise habitat requirements for *Campsicnemus*, as with the majority of diptera, are not fully understood and there are many opportunities for original research in this area.

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More dots on the map: further records of leafmining moths in East Yorkshire

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The apparent scarcity of many leafmining moths in East Yorkshire (see Sutton & Beaumont, 1989) is at least partly due to a lack of recorder effort, and a number of previously presumed scarce or rare moths are actually relatively widespread (Chesmore, 2008; Nunn, 2015). One of the aims of a previous article (Nunn, *op. cit.*) was, hopefully, to encourage searches for leafminers in an attempt to redress the imbalance of records in Yorkshire. This article summarises our 'leafminering' highlights from 2015.

A number of sites in VC61 were searched for leafmining moths (Table 1). Sampling effort varied considerably between sites. AN's 'leafminering' opportunities were mostly restricted to casual observations while on family outings; BW's focussed on sites that could be reached using public transport. The most time was spent in the Hessle area and a productive site in Hull. In October, the authors joined Charlie Fletcher and Ian Marshall for a day in an under-recorded 10km square, concentrating on the Settrington area. North Cliffe Wood was visited only in late spring and early summer, and other sites were visited briefly in the autumn.

Table 1. Most notable records by the authors of leafmining moths in East Yorkshire (VC61) in 2015.

Site	**NGR**	**Most notable records[2]**
Cottingham	TA0231	Oak Satin Lift *Heliozela sericiella*, Black-headed Pigmy *Stigmella atricapitella*, Common Oak Pygmy *Stigmella roborella*[3] Barred Sycamore Pigmy *Stigmella speciosa*
Flamborough	TA2169	Yarrow Case-bearer *Coleophora argentula* Fern Smut *Psychoides filicivora*[4]
Hessle area	TA0227	Elm Bent-wing *Bucculatrix albedinella* Flame Neb *Chrysoesthia drurella* Six-spot Neb *Chrysoesthia sexguttella* Mottled Purple *Eriocrania sparrmannella* Fern Smut Black-headed Pigmy[4] Narrow-barred Pigmy *Stigmella centifoliella*[4] White-barred Alder Pigmy *Stigmella glutinosae*[4] Chestnut Pigmy *Stigmella samiatella*[4]
Hull, Beverley Road	TA0831	Lime Bent-wing *Bucculatrix thoracella* Bordered Carl *Coptotriche marginea*

Hull, West	TA0629	Birch Lift *Heliozela hammoniella*[4] Common Birch Pigmy *Stigmella betulicola* Double-barred Pigmy *Stigmella continuella*
North Cave Wetlands	SE8833	Burdock Neb *Metzneria lappella*
North Cliffe Wood	SE8637	Grey Alder Case-bearer *Coleophora binderella* Forest Case-bearer *Coleophora ibipennella*[4] Pale Feathered Bright *Incurvaria pectinea*
Risby	TA0135	Coarse Hazel Pigmy *Stigmella floslactella* Oak Carl *Tischeria ekebladella*
Rowley	SE9932	Garden Lance-wing *Epermenia chaerophyllella*
Settrington area[1]	SE8673	Dusty Apple Pigmy *Bohemannia pulverosella* Daisy Bent-wing *Bucculatrix nigricomella* Dewberry Pigmy *Ectoedemia rubivora*[4] Small Elm Midget *Phyllonorycter schreberella* Base-spotted Pigmy *Stigmella basiguttella* Scarce Thorn Pigmy *Stigmella paradoxa* Little Beech Piercer *Strophedra weirana*
Sigglesthorne	TA1546	Grey-alder Midget *Phyllonorycter strigulatella*
Skidby	TA0133	Ribwort Slender *Aspilapteryx tringipennella* Garden Lance-wing Small Alder Midget *Phyllonorycter stettinensis* White-barred Alder Pigmy
Thwaite Gardens	TA0532	Hypericum Pigmy *Ectoedemia septembrella* Spotted Black Pigmy *Ectoedemia subbimaculella* Dark Hornbeam Midget *Phyllonorycter esperella*
University of Hull	TA0731	Larch Case-bearer *Coleophora laricella* Pale Thistle Case-bearer *Coleophora peribenanderi* Alder Lift *Heliozela resplendella* Pointed Groundling *Scrobipalpa acuminatella*
Walkington	SE9936	Large Birch Pigmy *Ectoedemia occultella* Fern Smut

[1] With Charlie Fletcher and Ian Marshall
[2] Sampling effort varied considerably between sites
[3] Adult reared, identification confirmed by gen. det. (Charlie Fletcher)
[4] New vice county record

As previously (Nunn, *op. cit.*), the relative lack of 'leafminering' in VC61 resulted in a number of new VC records, namely Forest Case-bearer (on Pedunculate Oak *Quercus robur*), Dewberry Pigmy (on *Rubus* sp. - see Plate 4, centre pages), Birch Lift (on Silver Birch *Betula pendula*), Fern Smut (on Hart's-tongue Fern *Phyllitis scolopendrium*), Black-headed Pigmy (on Pedunculate Oak), Narrow-barred Pigmy (on Dog-rose *Rosa canina*), White-barred Alder Pigmy (on Common Alder *Alnus glutinosa*) and Chestnut Pigmy (on Sweet Chestnut *Castanea sativa*). Other particularly notable moths included Oak Satin Lift, Common Oak Pygmy, Elm Bent-wing, Flame Neb (see Plate 4, centre pages), Six-spot Neb, Mottled Purple, Common Birch Pigmy, Grey Alder Case-bearer and Scarce Thorn Pigmy. Many of them, including Birch Lift, Fern Smut, Black-headed Pigmy, White-barred Alder Pigmy and Chestnut Pigmy, have probably been overlooked in the past, but Forest Case-bearer and Dewberry Pigmy, and

possibly Narrow-barred Pigmy, may be genuinely scarce or rare in Yorkshire. For example, the Forest Case-bearer larva found at North Cliffe Wood appears to be only the ninth record for Yorkshire, as the records cited in Sutton & Beaumont (1989) are considered unreliable (Box, 2016). Similarly, despite widespread searching, Dewberry Pigmy appears to be extremely rare outside the Ripon area, with just a single record from elsewhere (Box, *op. cit.*). The status and distribution of Narrow-barred Pigmy are unclear. Its mine is exceptionally difficult, if not impossible, to distinguish from that of the "common but thinly distributed or restricted resident" Rose Leaf Miner *Stigmella anomalella*, and it is therefore necessary to breed the adult to confirm the identity. Thus, although there is a small number of larval records from VC63, they remain unconfirmed as adults were not reared (Box, *op. cit.*).

Although Black-headed Pigmy, White-barred Alder Pigmy and Chestnut Pigmy are probably widespread in Yorkshire, there were no confirmed records in VC61 until 2015, due partly to uncertainties over whether they can be reliably identified to species from the mines or larvae; there appear to be some contradictions in the various resources (e.g. Ellis, 2016; Edmunds, 2016; Pitkin *et al.*, 2016) over what characteristics, if any, are diagnostic. The mines of most oak-feeding *Stigmella* spp. are widely considered impossible to identify to species but John Langmaid, one of the UK's leading authorities on leafmining moths, confirmed that the dark prothoracic shield is a diagnostic feature of the Black-headed Pigmy larva. The mine of Chestnut Pigmy is also very difficult or impossible to identify on oaks, but this problem was avoided when a mine was found on Sweet Chestnut (no other *Stigmella* spp. are known to mine Sweet Chestnut in the UK). Distinguishing the mines of the two alder-feeding *Stigmella* spp. can also be difficult but the White-barred Alder Pigmy larva has a dark prothoracic spot which is absent in the Silver-barred Alder Pigmy *Stigmella alnetella*. Thus, although suspected individuals of Black-headed Pigmy, Chestnut Pigmy and White-barred Alder Pigmy have been recorded previously, these were the first confirmed records in VC61. By contrast, Fern Smut is possibly limited by the distribution of its food plant (most often Hart's-tongue but also other ferns) in VC61, but was recorded in several locations in 2015 (Table 1).

This article demonstrates that, even with only relatively small amounts of effort or limited transport, it is possible to find a diverse range of leafmining moths, including in urban or suburban areas. Very few of the moths reported here were recorded in nature reserves. The Hessle area was particularly productive, due partly to the relatively large amount of effort there, but even casual observations sometimes revealed scarce or under-recorded moths, or at least put more 'dots on the map' to improve our knowledge of the geographical distributions of common ones. Most gardens, parks or hedgerows should support a variety of leafmining moths and we would encourage other naturalists to record them.

Acknowledgements

We would like to thank Harry Beaumont, Charlie Fletcher, John Langmaid and Dave Shenton for verifying the identity of difficult and/or under-recorded moths.

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Yorkshire Ichneumons: Part 5

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Introduction

Yorkshire statuses are taken from the chart shown on the YNU website.
ǂ = new county record
* = new vice-county record

Subfamily **PIMPLINAE**
Additions to Ely (2013a).
Tribe ***Ephialtini***
Scambus inanis (Schrank, 1802) and ***Scambus signatus*** (Pfeffer, 1913). The unconfirmed reports from VC64 in Ely (1987 p24) were based on specimens in the collection of Cliffe Castle Museum, Keighley, and both have now been confirmed.
Zatypota percontatoria (Muller, 1776)
*VC62: Fen Bog 15.7.2015 R.Crossley.

Subfamily **TRYPHONINAE**
Correction and additions to Ely (2015a):
Tribe ***Phytodietini***
Phytodietus (Phytodietus) gelitorius (Thunberg, 1822).
*VC61: Skipwith Common NNR 2.5.2011 R.Crossley.

Tribe ***Oedemopsini***
Oedemopsis scabricula (Gravenhorst, 1829). The unconfirmed report from VC62 in Hincks (1951a p28) was based on a specimen in the collection of Manchester Museum, which has now been confirmed.

Tribe ***Tryphonini***
Tryphon (Symboethus) exclamationis Gravenhorst, 1829. The record in Ely (2015a) is an error.
ǂVC63: Marley, Keighley 3.9.1926 J.Wood.

Tribe ***Exenterini***

Cteniscus pedatorius (Panzer, 1809).

*VC63: West Lane, Keighley 20.7 em 27.9.1931 J.Wood.

Eridolius bimaculatus (Holmgren, 1856). New to Yorkahire.

†VC61: North Cave Wetlands YWT NR 29.7.2015 R.Crossley.

Subfamily **ADELOGNATHINAE**

Additions to Ely (2015b):

Adelognathus britannicus Perkins, 1943. New to Yorkshire.

†VC63: Smithy Wood, Chapeltown 21.5.2014 R.Wilson.

Adelognathus chrysopygus (Gravenhorst, 1829).

*VC61: New Covert, Melbourne 4-11.9.2003 S.E.M.Fraser.

Adelognathus dorsalis (Gravenhorst, 1829).

*VC64: Hollins Hill, Baildon 22.8.2015 H.N.Whiteley.

Subfamily **CRYPTINAE** (cont.)

Tribe ***Gelini***

Subtribe ***Hemitelina***

Correction and additions to Ely (2015b):

Aclastus flavipes Horstmann, 1980.

*VC61: Many Gates Plantation, Stamford Bridge 4-11.9.2003 S.E.M.Fraser.

Aclastus gracilis (Thomson, 1884). The unconfirmed reports from VC64 in Hincks (1942 p172) and (1943b p48) were based on specimens in the collection of Manchester Museum, which have now been confirmed.

Aclastus solutus (Thomson, 1884).

Allerthorpe Common is in VC61!

*VC62: Ruston Cliff Wood, Forge Valley 5.9.1986 W.A.Ely.

Subtribe ***Gelina***

The mandibles are swollen immediately beyond the sharp basal grooves, though a few *Dichrogaster* lack this feature.

Xenolytus bitinctus (Gmelin, 1790). Rare in Yorkshire.

Unconfirmed record from VC64 by Bairstow *et al.* (1882 p107), Roebuck (1907 p214) and Morley (1907 p75).

*VC61: North Cave Wetlands YWT NR 5.2012 R.Crossley.

†VC63: Morton Wood 19.6.1985 D.Maude.

Dichrogaster aestivalis (Gravenhorst, 1829). Frequent in Yorkshire.

Unconfirmed record from VC62 by Roebuck (1877 p38; 1907 p214) and Morley (1907 p166).

*VC61: Stone Creek 8.6.1980 W.A.Ely.

*VC62: Coatham 7.8.2011 W.A.Ely.

†VC63: Langold Lake 14.6.1978 M.Crittenden,D.W.Twigg.

*VC64: Stub Wood, Acaster Malbis 1.6.1985 W.A.Ely.

Dichrogaster bischoffi (Schmiedeknecht, 1905). Scarce in Yorkshire.

*VC61: Brow Plantation, Potter Brompton 21.6.1986 W.A.Ely.

*VC62: Over Dinsdale 3.9.2012 W.A.Ely.

*VC63: Thrybergh Park 6.6.1985 W.A.Ely.

†VC64: Goldsborough Moor 16.5.1982 W.A.Ely.

*VC65: River Tees at Whorlton 18.7.2014 W.A.Ely.

Dichrogaster genalis (Habermehl, 1925). Rare in Yorkshire.

*VC61: North Cliffe Wood YWT NR 22.8.2011 R.Crossley

*VC62: Beast Cliff 6.9.1986 W.A.Ely.

†VC63: Round Wood, Thrybergh 10.9.1985 W.A.Ely.

*VC64: Studfold Quarry, Ribbledale 21.9.2014 W.A.Ely.

*VC65: Wath Urn Bridge, Aldbrough St John 3.9.2012 W.A.Ely.

Dichrogaster heteropus (Thomson, 1896). Rare in Yorkshire.

*VC62: Scar Wood & Castlebeck Wood, Scarborough 7.9.1986 W.A.Ely.

†VC63: Holmehouse Wood, Keighley 12 + 25.10.1942 + 4.9.1943 J.Wood.

*VC65: West Burton Force 3.10.1985 I.F.G.McLean & Barney Beck, Healaugh 3.10.1985 W.A.Ely.

Dichrogaster liostylus (Thomson, 1885). Rare in Yorkshire.

*VC61: Jeffry Bog Plantation YWT NR 2.7.2013 R.Crossley.

*VC62: Scar Wood & Castlebeck Wood 7.9.1986 W.A.Ely.

†VC63: Burnt Wood, Treeton 25.7.1982 W.A.Ely.

*VC64: Elleker Wood, East Keswick 24.7.2014 W.A.Ely.

*VC65: Cleasby 3.9.2012 W.A.Ely.

Dichrogaster modesta (Gravenhorst, 1829). Rare in Yorkshire.

*VC61: Hacking Wood, Escrick Park & New Covert, Melbourne 4-11.9.2003 S.E.M.Fraser.

*VC62: Folly Wood, Huby 9.10.2011 W.A.Ely.

†VC63: Barbot Hall, Greasborough 30.8.1985 W.A.Ely.

*VC64: Copmanthorpe Wood 4-11.9.2003 S.E.M.Fraser.

Dichrogaster schimitscheki (Fahringer, 1935). Rare in Yorkshire.

†VC63: Fitzwilliam Canal, Parkgate 24.8.1978 M.Crittenden, D.W.Twigg.

*VC64: disused railway, Drax Hales 26.7.1987 W.A.Ely.

Gelis acarorum (Linnaeus, 1758).

Unconfirmed record from VC62 by Walsh & Rimington (1956 p276).

Gelis agilis (Fabricius, 1775). Frequent in Yorkshire.

Reported from VC61 by Hincks (1945 p143; 1949a p33) and Schwarz & Shaw (1999 p122), from VC62 by Roebuck (1877, p38; 1907 p214) and from VC64 by Hincks (1941 p246).

*VC63: Bow Broom, Swinton 23.8.1976 W.A.Ely.

Gelis albipalpus (Thomson, 1884). Rare in Yorkshire.

*VC61: Harrop's Plantation, Escrick Park 4-11.9.2003 S.E.M.Fraser.

†VC63: Ecclesfield 24.8.1985 W.A.Ely.

Gelis anthracinus (Förster, 1850). Scarce in Yorkshire.

Reported from VC61 by Hincks (1949a p33; 1953 p135), from VC63 by Hincks (1943c p125; 1944 p37) and from VC64 by Hincks (1943a p59).

*VC62: Whitby 27.8.1897 unknown.

Gelis areator (Panzer, 1804). Frequent in Yorkshire.

Unconfirmed records from VC62 by Roebuck (1877, p38; 1907 p214), Morley (1907 p133) and Walsh & Rimington (1956 p127). Reported from VC61 by Schwarz & Shaw (1999 p122), from VC63 by Hincks & Dibb (1940 p174), Hincks (1946 p170), Skidmore *et al*. (1987 p127), Coldwell (1999 p61), Schwarz & Shaw (1999 p122) and Skidmore (2006 p148) and from VC64 by Hincks & Dibb (1940 p174) and Schwarz & Shaw (1999 p122).

*VC62: Keld Head 10.10.1985 G.King.

*VC65: Witton Fell 29.8.1963 [E.Broadhead].

Gelis bicolor (Villers, 1789). Uncommon in Yorkshire.

Unconfirmed records from VC62 by Walsh (1922 p72) and Walsh & Rimington (1956 p127), from VC63 by Skidmore et al. (1987 p127) and Skidmore (2006 p148) and from VC65 by Walsh (1922 p72). Reported from VC61 by Hincks (1953 p135).

*VC62: Hell Bank Wood, Appleton Mill 25.5.1985 W.A.Ely.
*VC63: Crow Wood, Finningley 5.9.1977 P.Skidmore.
*VC64: Swinsty Reservoir 12.5.1979 W.A.Ely.
*VC65: River Swale, Downholme Park 25.7.1987 W.A.Ely.

Gelis cayennator (Thunberg, 1824). Rare in Yorkshire.

*VC62: Sutton Park 3.7.2011 W.A.Ely.
†VC63: Thrybergh Park 6.6.1985 W.A.Ely.
*VC64: Hollins Hill, Baildon 8.2012 + 9.2013 H.N.Whiteley.

Gelis cinctus (Linnaeus, 1758). Rare in Yorkshire.

Unconfirmed records from VC62 by Walsh & Rimington (1956 p276) and from VC63 by Porritt (1883 p94). Reported from VC61 by Hincks & Shaw (1954 p104).

*VC64: Low Bentham winter 2012 + 30.6.2013 T.M.Whitaker.

Gelis discedens (Förster, 1850). Rare in Yorkshire.

*VC61: Land of Nod, Holme on Spalding Moor 5.7.1981 W.A.Ely.
†VC63: Cramfit Bridge marsh, North Anston 11.7.1978 M.Crittenden,D.W.Twigg.
*VC64: Austwick Moss 30.5.1987 W.A.Ely.

Gelis edentatus (Förster, 1850). Rare in Yorkshire.

Unconfirmed records from VC62 by Walsh (1922 p72) and Walsh & Rimington (1956 p127) and from VC63 by Hincks (1943a p59). Reported from VC61 by Hincks (1953 p135).

Gelis exareolatus (Förster, 1850). Rare in Yorkshire.

Reported from VC64 by Ely (2015d p234).

*VC63: St Ives, Keighley 3.8.1950 J.Wood.
*VC65: Semerwater YWT NR 20.8.1988 W.A.Ely.

Gelis festinans (Fabricius, 1798). Rare in Yorkshire.

Unconfirmed records from VC61 by Walsh & Rimington (1956 p276) and from VC62 by Walsh (1922 p72; 1923 p140).

*VC62: RAF Fylingdales 7.-9.1996 unknown.
†VC63: Pasture Marsh, Denaby Ings YWT NR 18.8.1984 W.A.Ely.

Gelis formicarius (Linnaeus, 1758)

Unconfirmed record from VC62 by Walsh (1922 p72).

Gelis hortensis (Christ, 1791). Rare in Yorkshire.

†VC61: Bubwith 1920s-30s W.J.Fordham.
*VC63: Hexthorpe Ings, Doncaster 8.1.1973 P.Skidmore.
*VC64: Askham Bog YWT NR 23.8.1950 unknown.

Gelis intermedius (Förster, 1850). Rare in Yorkshire.

†VC63: Bowden Howsteads Wood, Sheffield 21.6.1987 A.S.Lazenby.
*VC64: Bilton disused railway embankment & Bilton Beck Wood 1.7.1989 W.A.Ely.

Gelis longicauda (Thomson, 1884). Rare in Yorkshire.

*VC61: Queen's Gardens, Hull ex *Leucoma salicis* 2013 K.Smith.
†VC62: Malton Road, York 7.7.1945 J.H.Elliott.
*VC63: Worsborough Reservoir 14.7.1985 W.A.Ely.
*VC64: Timble Ings, Otley 19.8.1984 W.A.Ely.

Gelis meigenii (Förster, 1850). Rare in Yorkshire.

Unconfirmed record from VC62 by Walsh & Rimington (1956, p276).

*VC61: Skipwith Common 13.8.1988 W.A.Ely.

†VC62: Fyling Hall moor 24.6.1929 W.J.Fordham.
*VC63: Thorne Moors ex *Philudoria potatoria* 24.6.1979 em 1979 D.A.Shepherd.

Gelis melanocephalus (Schrank, 1781). Scarce in Yorkshire.
Reported from VC61 by Hincks (1953 p72) and from VC62 by Walsh & Rimington (1956 p276).
*VC63: Holme House, Armthorpe 9.1975 J.T.Burn.
*VC64: Roundhay, Leeds 10.8.1938 W.D.Hincks.

Gelis micrurus (Förster, 1850). Rare in Yorkshire.
†VC62: Low Mill, Farndale 18.8.2012 W.A.Ely.

Gelis mutillatus (Gmelin, 1790). Rare in Yorkshire.
†VC61: Skeffling 15.8.1949 W.D.Hincks.

Gelis obscuripes Horstmann, 1986. New to Yorkshire.
†VC62: Snargate Hill 2.9.2011 W.A.Ely (det. M.Schwarz).

Gelis proximus (Förster, 1850). Uncommon in Yorkshire.
Unconfirmed records from VC64 by Hincks (1943b p122). Reported from VC61 by Hincks (1953 p135) and Schwarz & Shaw (1999 p122), from VC62 by Hincks (1943b p122), Walsh & Rimington (1956 p276) and Schwarz & Shaw (1999 p137) and from VC63 by Hincks (1949b p162; 1951a p28) and Coldwell (1999 p61).
*VC64: Malham Tarn 12.8.1955 + 15.9.1957 + 26.7 + 17.8.1958 W.D.Hincks.

Gelis pulicarius (Fabricius, 1793).
Unconfirmed records from VC61 by Walsh (1923 p140), from VC62 by Walsh (1923 p140) and Walsh & Rimington (1956 p276) and from VC64 by Hincks (1943a p59).

Gelis rufipes (Förster, 1850). Rare in Yorkshire.
Reported from VC61 by Hincks (1949a p33; 1953 p130, 135).

Gelis rufogaster Thunberg, 1827. Scarce in Yorkshire.
Unconfirmed records from VC62 by Walsh (1922 p72; 1923 p140) and Walsh & Rimington (1956 p276) and from VC63 by Hincks (1943a p59). Reported from VC61 by Hincks (1943a p59) and from VC64 by Schwarz & Shaw (1999 p138).
*VC62: Reins Wood, Ashberry Pastures YWT NR 8.6.1980 W.A.Ely.
*VC63: Will Pits, Thorne Moors 23.4.1977 P.Skidmore.
*VC65: River Swale, Downholme Park 25.7.1987 W.A.Ely.

Gelis trux (Förster, 1850). Rare in Yorkshire.
Unconfirmed record from VC62 by Roebuck (1907 p214) and Morley (1907 p225). Reported from VC61 by Hincks (1953 p135).

Gelis viduus (Förster, 1850). Rare in Yorkshire.
†VC62: RAF Fylingdales 7-9.1996 unknown (det. M.Schwarz).
*VC64: Adel Dam YWT NR 29.9.2011 R.Lennon.

Thaumatogelis audax (Olivier, 1792). Rare in Yorkshire.
Unconfirmed record from VC65 by Morley (1907 p189). Reported from VC61 by Hincks (1953 p135).

Agasthenes varitarsus (Gravenhorst, 1829). Scarce in Yorkshire.
*VC61: East Clough, North Ferriby 31.7.2013 R.Crossley.
*VC62: River Derwent, Kirkham Abbey 2.9.2013 W.A.Ely.
†VC63: Cramfit Bridge marsh 11.7.1978 M.Crittenden,D.W.Twigg.

Subtribe ***Gnypetomorpha***
The second recurrent vein in the forewing is largely obliterated, a situation otherwise only found in *Aclastus solutus*.

Gnypetomorpha obscura (Bridgman, 1883). Rare in Yorkshire.

†VC63: Firsby Reservoir, Ravenfield 31.7.2001 W.A.Ely.

Subtribe ***Ethelurgina***

The area superomedia is transverse and the clypeus has a thin, impressed apex.

Rhembobius perscrutator (Thunberg, 1824). Rare in Yorkshire

Unconfirmed record from VC62 by Walsh & Rimington (1956 p276). Reported from VC64 by Godfrey & Whitehead (2001 p65-81) and Schwarz & Shaw (2010 p198).

*VC62: Hell Bank Wood 25.5.1985 W.A.Ely.

Rhembobius quadrispinus (Gravenhorst, 1829). Rare in Yorkshire.

Reported from VC63 by Hincks (1943b p58-9), Coldwell (1999 p61) and Ely (2014b p38).

*VC61: North Duffield Carrs YWT NR 22.7.2015 R.Crossley.

*VC64: Askham Bog YWT NR 15.7.1944 W.D.Hincks.

Ethelurgus sodalis (Taschenberg, 1865). Uncommon in Yorkshire.

Reported from VC61 by Hincks (1951a p28; 1953 p135) and from VC64 by Schwartz & Shaw (2010 p198).

*VC62: Carlton Husthwaite 2.9.2011 W.A.Ely.

*VC63: Holmehouse Wood 11 + 18.8.1940 J.Wood.

*VC65: North Cowton 10.6.2012 W.A.Ely.

Subtribe ***Mastrina***

The nervellus vein in the hindwing slopes strongly outward and the apex of the scape is steeply angled.

Charitopes areolaris (Thomson, 1884). Rare in Yorkshire.

Unconfirmed records from VC61 by Fordham (1919 p70) and from VC63 by Hincks (1943b p58). Reported from VC63 by Ely (2014b p42).

*VC61: Hacking Wood 4-11.9.2003 S.E.M.Fraser.

Charitopes carri (Roman, 1923). Rare in Yorkshire.

Reported from VC64 by Hincks (1947 p38) and Schwarz & Shaw (2010 p197).

*VC61: Wigman Wood, Wheldrake 4-11.9.2003 S.E.M.Fraser.

*VC63: Holmehouse Wood 14.9.1946 J.Wood.

*VC65: Cordilleras Wood 18.8.1990 W.A.Ely.

Charitopes clausus (Thomson, 1888). Scarce in Yorkshire.

Reported from VC64 by Godfrey & Whitehead (2000 p65-81) and Schwarz & Shaw (2010 p197).

*VC61: Hacking Wood 4-11.9.2003 S.E.M.Fraser.

*VC62: Chafer Wood YWT NR 29.5.1988 W.A.Ely.

*VC63: Wentworth Park 15.4.1984 W.A.Ely.

*VC65: Witton Fell 7 + 27.4.1964 [E.Broadhead].

Charitopes gastricus (Holmgren, 1868). Scarce in Yorkshire.

Reported (as *Dichrogaster aestivalis*) from VC63 by Hincks (1943b p48).

*VC61: Allerthorpe Common 30.6.1984 W.A.Ely.

*VC62: Coatham 7.8.2011 W.A.Ely.

*VC64: Greenland Wood, Copmanthorpe 4-11.9.2003 S.E.M.Fraser.

*VC65: River Swale, Downholme Park 25.7.1987 W.A.Ely.

Isadelphus armatus (Gravenhorst, 1829). Rare in Yorkshire.

†VC63: Thorne Moors NNR 22.8.2014 W.A.Ely.

Isadelphus gallicola (Bridgman, 1880). Rare in Yorkshire.

†VC63: Ecclesfield 24.8.1985 W.A.Ely.

*VC64: Staveley YWT NR 7.8.2011 C.H.Fletcher.

Isadelphus inimicus (Gravenhorst, 1829). Scarce in Yorkshire.
Unconfirmed report from VC63 by Anon (1911 p55), Coldwell (1999 p61) and Ely (2014b p38).

*VC62: Lealholm 30.8.2013 G.Featherstone.
*VC63: Barley Hall Colliery site, Thorpe Hesley 11.9.1991 W.A.Ely.
†VC64: Camblesforth, Drax 21.7.1987 W.A.Ely.
*VC65: River Swale, Downholme Park 25.7.1987 W.A.Ely.

Zoophthorus cynipinus (Thomson, 1884). Rare in Yorkshire.
Reported from VC61 by Schwarz & Shaw (2010 p191).
Zoophthorus graculus (Gravenhorst, 1829).
Unconfirmed report from VC62 by Roebuck (1907 p214) and Morley (1907 p150).
Zoophthorus infirmus (Gravenhorst, 1829).
Unconfirmed report from VC62 by Walsh & Rimington (1956 p275).
Odontoneura annulicornis (Thomson, 1884). Rare in Yorkshire.
Reported from VC63 by Ely (2014b p42).
Mastrulus marshalli (Bridgman & Fitch, 1882). Rare in Yorkshire.
Unconfirmed report from VC64 by Hincks (1943b p58).

†VC63: Wickersley Wood 13.7.2005 W.A.Ely.
*VC64: Hackfall 6.5.2011 C.H.Fletcher.

Helcostizus restaurator (Fabricius, 1775).
Unconfirmed report from VC62 by Morley (1907 p4).

Subtribe ***Endaseina***
The nervellus vein in the hindwing slopes strongly outward and the apex of the scape is right-angled.
Endasys brevis (Gravenhorst, 1829). Rare in Yorkshire.
Unconfirmed reports from VC62 by Roebuck (1877 p38; 1907 p214), Morley (1907 p69) and Walsh & Rimington (1956 p276) and from VC63 by Skidmore *et al.* (1987 p127), Skidmore (2006 p148) and Ely (2014b p38).

*VC63: Slippery Stones, Derwent valley 24.7.1990 D.Whiteley.
†VC65: Pennine Way, Middleton-in-Teesdale 21.6.1981 W.A.Ely.

Endasys erythrogaster (Gravenhorst, 1829). Rare in Yorkshire.
Reported from VC62 by Hincks (1945 p141) and Walsh & Rimington (1956 p276), from VC63 by Hincks (1943c p125) and from VC64 by Hincks (1943a p58).
Endasys minutulus (Thomson, 1883). Uncommon in Yorkshire.
Reported from VC64 by Ely (2012a p224).

*VC61: Cali Heath YWT NR 1.6.2014 + 2.6.2015 R.Crossley.
*VC62: Ashberry Pastures YWT NR 15.6.1977 P.Skidmore.
*VC63: Sandal Beat, Doncaster 21.6.1979 P.Skidmore.

Endasys plagiator (Gravenhorst, 1829). Uncommon in Yorkshire.
Reported (as *Glyphicnemis atrata*) from VC63 by Hincks (1943b p58).

*VC61: Frog Hall, Allerthorpe Common 7.7.1928 W.J.Fordham.
*VC62: Stockingdale Farm 25.6.1983 W.A.Ely.
*VC64: Askham Bog YWT NR 20 + 30.8.1950 J.H.Elliott.
*VC65: Pennine Way at Middleton-in-Teesdale 21.6.1981 W.A.Ely.

Endasys senilis (Gmelin in Linnaeus, 1790).
Unconfirmed report from VC61 by Fordham (1919 p70).
Endasys striatus (Kiss, 1924). Rare in Yorkshire.

*VC62: Ellerburn Bank YWT NR 4-8.7.2010 P.J.Mayhew.

*VC63: Woodall Pond, Norwood 27.6.1978 M.Crittenden,D.W.Twigg.
†VC64: Askham Bog YWT NR 5.8.1950 J.H.Elliott.

Endasys testaceipes (Brischke, 1881). Rare in Yorkshire.
Reported from VC63 by Ely (2014b p42).

Endasys varipes (Gravenhorst, 1829). Rare in Yorkshire.
*VC63: Thorpe Common, Thorpe Hesley 12.8.1974 W.A.Ely.
†VC64: Biggin Lane, Wike 7.8.1944 W.D.Hincks.

Glyphicnemis atrata (Strobl, 1901). Scarce in Yorkshire.
Unconfirmed reports from VC61 by Fordham (1919 p70) and from VC63 by Anon (1906 p372), Roebuck (1907 p214), Morley (1907 p67), Fordham (1919 p70), Bayford (1938 pxii) and Ely (2014b p38). Reported from VC61 by Schwarz & Shaw (2010 p199) and from VC64 by Hincks & Dibb (1940 p174), Hincks (1943a p58) and Schwarz & Shaw (2010 p199).
*VC62: Dovedale 23.8.1987 W.A.Ely.
*VC63: Berry Lane, Morton 31.7.1942 J.Wood.
*VC65: White Scar, Downholme Park 25.7.1987 W.A.Ely.

Glyphicnemis clypealis (Thomson, 1883). Rare in Yorkshire.
Reported from VC63 by Ely (2014b p42).

Glyphicnemis profligator (Fabricius, 1775). Frequent in Yorkshire.
Unconfirmed reports from VC62 by Walsh & Rimington (1956 p276). Reported from VC61 by Hincks & Dibb (1940 p174) and Hincks (1953 p135) and from VC63 and VC64 by Hincks & Dibb (1940 p174).
*VC62: Strensall 26.6.1950 J.H.Elliott.
*VC65: Marsett Bridge 19.7.1986 W.A.Ely.

Glyphicnemis vagabunda (Gravenhorst, 1829). Rare in Yorkshire.
Unconfirmed report from VC64 by Wilson (1883 p109) and Roebuck (1907 p214).
†VC61: Frog Hall 7.7.1928 W.J.Fordham.

Subtribe ***Phygadeuontina***
The nervellus vein in the hindwing is vertical and the apex of the scape is right-angled.

Sulcarius biannulatus (Gravenhorst, 1829). Rare in Yorkshire.
Reported from VC64 by Hincks (1944c p133; 1946a p38).

Tropistes nitidipennis Gravenhorst, 1829. Rare in Yorkshire.
*VC61: Wilson's Plantation, Stamford Bridge 5-12.8.2003 S.E.M.Fraser.
†VC65: Gill Wood 4.10.1985 W.A.Ely.

Orthizema triannulatum (Thomson, 1884). Rare in Yorkshire.
†VC63: Monk Wood, Rawmarsh 18.5.2003 W.A.Ely.
*VC64: Copmanthorpe Wood 4-11.9.2003 S.E.M.Fraser.

Tricholinum ischnocerum (Thomson, 1888). Rare in Yorkshire.
*VC61: East Clough 30.5.2014 R.Crossley.
†VC63: Hooton Cliff 24.5.1980 W.A.Ely.

Platyrhabdus clypeatus Horstmann, 1998. Uncommon in Yorkshire
*VC61: Melbourne Hall 4-11.9.2003 S.E.M.Fraser.
*VC62: Kirkleavington 15.6.2013 W.A.Ely.
†VC63: Rawmarsh 1.8.1984 W.A.Ely.
*VC64: Drax 21.7.1987 W.A.Ely.

Gnotus chionops (Gravenhorst, 1829). Rare in Yorkshire.
†VC62: Strensall 23.3.1936 M.D.Barnes.
*VC63: Park Wood, Keighley 29.6.1940 J.Wood.

*VC64: Laver Banks 10.8.2012 C.H.Fletcher.

Gnotus macrurus (Thomson,1884). Rare in Yorkshire.

†VC62: Flamingo Land 20.9.2013 W.A.Ely.

Gnotus tenuipes (Gravenhorst, 1829).

Unconfirmed report from VC64 by Hincks (1943a p58).

Uchidella brevicauda Horstmann, 1993. Rare in Yorkshire.

†VC65: Hag Wood, Richmond 20.6.2014 W.A.Ely.

Uchidella flavilabris Horstmann, 1993. Rare in Yorkshire.

†VC63: Hesley Wood 17.7.2002 W.A.Ely.

*VC64: Hollins Hill 6.2013 H.N.Whiteley.

Uchidella longicaudata Horstmann, 1997. Rare in Yorkshire.

Reported from VC63 by Ely (2014b p42).

Stibeutes brevicornis (Lange, 1911). Rare in Yorkshire.

Reported from VC61 by Ely (2015c p223).

*VC62: Chafer Wood YWT NR 28.5.1988 W.A.Ely.

*VC64: Halton Moor playing fields, Leeds 4.6.2012 W.A.Ely

Stibeutes curvispina (Thomson, 1884). Rare in Yorkshire.

*VC61: Fisherman's Channel 17.8.1986 W.A.Ely.

*VC63: Thrybergh CP 12.7.2000 W.A.Ely.

†VC65: Colsterdale 7.7.1984 W.A.Ely.

Stibeutes gravenhorstii Förster, 1850.

Unconfirmed reports from VC62 by Walsh (1922 p72) and Walsh & Rimington (1956 p275).

Stibeutes heinemanni Förster, 1850. Scarce in Yorkshire.

Reported from VC61 by Hincks (1953 p130, 135) and from VC63 by Hincks (1943a p58).

Stibeutes heterogaster (Thomson, 1885). Rare in Yorkshire. Reported (as *Dichrogaster aestivalis*) from VC63 by Hincks (1943b p58).

*VC61: Thorpe Hall, Rudstone 15.7.1989 W.A.Ely.

*VC62: Beast Cliff 6.9.1986 W.A.Ely (det. M.Schwarz).

Theroscopus esenbeckii (Gravenhorst, 1815). Rare in Yorkshire.

Unconfirmed reports from VC62 by Walsh (1922 p72) and Walsh & Rimington (1956 p276).

Reported from VC61 by Hincks (1951a p28; 1951b p86; 1953 p130,135).

Theroscopus ochrogaster (Thomson, 1888). Rare in Yorkshire.

†VC61: Skipwith Common NNR 1.6.2011 R.Crossley.

*VC63: Barrow Colliery site 18.7.2011 C.Hopkinson.

*VC64: Malham Tarn Fen 5.2013 P.W.H.Flint,S.Flint.

*VC65: Hag Wood 20.6.2014 W.A.Ely.

Theroscopus pullator (Gravenhorst, 1829). New to Yorkshire.

†VC63: Pot Riding Wood, Sprotborough Flash YWT NR 31.10.1989 W.A.Ely (det. M.Schwarz).

Theroscopus rufulus (Gmelin, 1790).

Unconfirmed reports from VC61 by Fordham (1926 p118) and from VC62 by Roebuck (1877 p38; 1907) p214) and Morley (1907 p169).

Phygadeuon cubiceps Thomson, 1884. Rare in Yorkshire.

†VC64: Malham Tarn 20.7.1956 W.D.Hincks.

Phygadeuon dubius (Gravenhorst, 1829).

Unconfirmed report from VC64 by Hincks (1943a p58).

Phygadeuon exiguus Gravenhorst, 1829.

Unconfirmed report from VC62 by Walsh & Rimington (1956 p275).

Phygadeuon fumator Gravenhorst, 1829. Rare in Yorkshire.
Unconfirmed reports from VC62 by Roebuck (1877 p38; 1907 p214) and Morley (1907 p98).
†VC61: Spurn Point YWT NNR 10.11.1986 W.A.Ely.
Phygadeuon gracilentus Horstmann, 1997. New to Yorkshire.
†VC63: Thrybergh CP 25.7.1988 W.A.Ely (det. M.Schwarz).
Phygadeuon infelix Dalla Torre, 1901.
Unconfirmed reports from VC63 and VC64 by Hincks (1943a p58).
Phygadeuon nitidus Gravenhorst, 1829. Rare in Yorkshire.
Reported from VC63 by Hincks (1951a p28), Coldwell (1999 p61) and Ely (2014b p38,42).
Phygadeuon ovatus Gravenhorst, 1829.
Unconfirmed report from VC62 by Walsh & Rimington (1956 p276).
Phygadeuon paradoxus (Bridgman, 1889).
Unconfirmed report from VC62 by Walsh & Rimington (1956 p276).
Phygadeuon rugulosus Gravenhorst, 1829.
Unconfirmed reports from VC62 by Roebuck (1877 p38; 1907 p214) and Morley (1907 p83) and from VC64 by Hincks (1942 p172; 1943a p58).
Phygadeuon trichops Thomson, 1884. Rare in Yorkshire.
*VC61: Burdale Tunnel, Wharram Percy 9.4.1980 S.G.Compton (det. M.Schwarz).
†VC64: Malham Tarn 15.6.1954 + 19.8.1955 W.D.Hincks.
Phygadeuon variabilis Gravenhorst, 1829.
Unconfirmed reports from VC62 by Roebuck (1877 p38; 1907 p214), Morley (1907 p89), Walsh (1923 p40) and Walsh & Rimington (1956 p275) and from VC63 by Bairstow *at al.* (1882 p104), Roebuck (1907 p214) and Morley (1907 p89).
Phygadeuon vexator (Thunberg, 1824). Rare in Yorkshire.
Unconfirmed reports from VC62 by Roebuck (1907 p214) and Morley (1907 p91). Reported from VC61 *by* Hincks (1953 p135).
Megacara hortulana (Gravenhorst, 1829).
Unconfirmed reports from VC64 by Anon (1915a p41), Anon (1915d p44) and Roebuck (1915 p194.

Subtribe ***Bathytrichina***
The petiole is slender and the smooth face is covered in silvery decumbent hairs.
Bathythrix aerea (Gravenhorst, 1829). Scarce in Yorkshire.
*VC61: Wigman Wood, Wheldrake 4-11.9.2003 S.E.M.Fraser.
*VC63: Morley Pond, Wentworth Park 4.9.1978 M.Crittenden,D.W.Twigg.
†VC64: Malham Tarn 14-15.8.1955 + 14-15.7.1957 W.D.Hincks.
Bathythrix claviger (Taschenberg, 1865). Scarce in Yorkshire.
Unconfirmed reports from VC62 by Walsh & Rimington (1956 p275) and from VC64 by Wilson (1883 p109), Bridgman & Fitch (1883 p38), Roebuck (1907 p214) and Morley (1907 p108). Reported from VC63 by Hincks & Dibb (1940 p174).
*VC61: Frog Hall 22.9.1930 W.J.Fordham.
*VC62: Malton & Norton Golf Course 2.9.2013 W.A.Ely.
*VC64: Winterburn 28.8.1926 J.Wood.
*VC65: Hag Wood 20.6.2014 W.A.Ely.
Bathythrix formosa (Desvignes, 1860). Rare in Yorkshire.
Reported from VC63 by Ely (2014b p42).
Bathythrix fragilis (Gravenhorst, 1829). Rare in Yorkshire.
Unconfirmed report from VC64 by Wilson (1883 p109). Reported from VC61 by Ely (2015c p223).

*VC63: Lob Wells Wood 5.7.1984 W.A.Ely.
*VC64: Stub Wood 1.6.1985 W.A.Ely.

Bathythrix lamina (Thomson, 1884). Scarce in Yorkshire.
*VC61: New Covert & Wigman Wood 4-11.9.2003 S.E.M.Fraser.
†VC63: Anston Stones Wood 8.7.1979 + 18.10.1981 W.A.Ely.
*VC64: Goldsborough Moor 16.5.1982 W.A.Ely.

Bathythrix pellucidator (Gravenhorst, 1829). Common in Yorkshire.
Reported from VC64 by Hincks (1943 p58).
*VC61: Allerthorpe Common 30.6.1984 W.A.Ely.
*VC62: Stockendale Farm, Whitby 25.6.1983 W.A.Ely.
*VC63: Holmehouse Wood 7.8.1940 J.Wood.
*VC65: Langton Wood 9.6.2011 W.A.Ely,M.McKerchar.

Bathythrix prominens (Strobl, 1901). Scarce in Yorkshire.
*VC61: Hacking Wood 4-11.9.2003 S.E.M.Fraser.
*VC63: Pot Riding Wood 26.8.1989 W.A.Ely.
*VC64: Grass Wood YWT NR 3.9.1988 W.A.Ely.
†VC65: Hag Wood 4.10.1985 I.F.G.McLean.

Bathythrix tenuis (Gravenhorst, 1829).
Unconfirmed report from VC64 by Roebuck (1907 p214).

Bathythrix thomsoni (Kerrich, 1942). Rare in Yorkshire.
Reported from VC61 by Schwarz & Shaw (2010 p203).
*VC64: Greenland Wood, Copmanthorpe 4-11.9.2003 S.E.M.Fraser.

Subtribe ***Stilpnina***
The areas superomedia and petiolaris of the propodeum are fused into one long trough.

Stilpnus (Polyrhembia) tenebricosus (Gravenhorst, 1829). Common in Yorkshire.
Unconfirmed reports from VC62 by Walsh & Rimington (1956 p276), from VC63 by Butterfield (1909 p197) and from VC64 by Morley (1919 p33). Reported from VC64 by Ely (2012a p224).
*VC61: Barmby Moor 1.8.1924 W.J.Fordham.
*VC62: Clifton Ings 26.8.1945 J.H.Elliott.
*VC63: Holmehouse Wood 25.8.1940 J.Wood.
*VC65: Colsterdale 7.7.1984 W.A.Ely.

Stilpnus (Stilpnus) blandus Gravenhorst, 1829. Rare in Yorkshire.
†VC61: Painsthorpe 21.6.1980 W.A.Ely.
*VC64: Blubberhouses Moor 21.8.2011 A.R.Godfrey.
*VC65: Semerwater YWT NR 20.8.1988 W.A.Ely.

Stilpnus (Stilpnus) crassicornis Thomson, 1884. Scarce in Yorkshire.
VC61: Bainton 2.6.2011 W.A.Ely.
†VC62: Malton Road, York 15.6.1952 J.H.Elliott.
*VC63: White Quarry Plantation, Dinnington 28.6.1979 W.A.Ely.
*VC64: Drax Abbey Farm 23.7.1987 W.A.Ely.
*VC65: Ellington Firth, Masham 21.7.1964 [E.Broadhead] (det R.Jussila).

Stilpnus (Stilpnus) deplanatus Gravenhorst, 1829.
Unconfirmed report from VC63 by Hincks (1943a p59); the identity and status of this ichneumon are not known.

Stilpnus (Stilpnus) gagates (Gravenhorst, 1807). Scarce in Yorkshire.
Unconfirmed reports from VC62 by Roebuck (1877 p37; 1907 p214), Morley (1907 p342) and Walsh & Rimington (1956 p276). Reported from VC63 by Hincks & Dibb (1940 p174).

*VC61: Skipwith Common NNR 2.9.1916 W.J.Fordham.
*VC62: Redcar dunes 7.8.2011 W.A.Ely.
*VC64: Malham Tarn 17.8.1958 W.D.Hincks.
*VC65: Crackpot, Wensleydale 4.10.1985 W.A.Ely.

Stilpnus (Stilpnus) parvulus Förster, 1876. Scarce in Yorkshire.
*VC61: Skipwith Common NNR 13.8.1988 W.A.Ely (det R.Jussila).
†VC63: Langold Lake 22.9.1978 M.Crittenden,D.W.Twigg.
*VC64: Hollins Hill 6.2013 H.N.Whiteley.

Stilpnus (Stilpnus) pavoniae (Scopoli, 1763). Common in Yorkshire.
*VC61: Wilson's Plantation, Limefield Farm, Stamford Bridge 4-11.9.2003 S.E.M.Fraser.
*VC62: Ruston Cliff Wood, Forge Valley 5.9.1986 W.A.Ely.
†VC63: Fishlake 3.7.1976 P.Skidmore.
*VC64: Constitution Hill, Fountains Abbey 15.9.1984 W.A.Ely.
*VC65: Marfield 30.8.1980 W.A.Ely.

Stilpnus (Stilpnus) subzonulus Förster, 1876. Uncommon in Yorkshire.
*VC61: West End Farm, Muston + Speeton Manor 28.9.2011 W.A.Ely.
*VC62: Staindale 22.8.1987 W.A.Ely.
†VC63: Fishlake oxbow 3.7.1976 P.Skidmore.
*VC64: Constitution Hill 15.9.1984 W.A.Ely.
*VC65: West Burton Force 3.10.1985 I.F.G.McLean.

Mesoleptus congener (Förster, 1876). Scarce in Yorkshire.
†VC63: Norwood Locks 12.7.1979 W.A.Ely.
*VC64: Malham Tarn Fen 21.7.1984 W.A.Ely.
*VC65: Stainton Low Wood 2.10.1985 W.A.Ely.

Mesoleptus devotus (Förster, 1876). Scarce in Yorkshire.
*VC62: Vicars Moor, Thirsk 13.9.2012 W.A.Ely.
*VC64: Drax Abbey 23.7.1987 W.A.Ely.
†VC65: Freeholders' Wood 15.6.1985 W.A.Ely.

Mesoleptus distinctus (Förster, 1876). Rare in Yorkshire.
*VC61: Church Lane, Wintringham 17.5.2014 W.A.Ely.
*VC63: Pot Riding Wood 26.9.1989 W.A.Ely.
†VC64: Stub Wood 1.6.1985 W.A.Ely.

Mesoleptus incessor (Haliday, 1838). Uncommon in Yorkshire.
Unconfirmed report from VC62 by Roebuck (1907 p214) and Morley (1907 p256).
*VC61: Allerthorpe Common 5.8.1989 W.A.Ely.
*VC62: Caydale 24.6.1984 W.A.Ely.
†VC63: Moorends, Thorne 16.7.1978 W.A.Ely.
*VC64: Ash Wood, Drax 27.7.1987 W.A.Ely.
*VC65: Rowton Beck, Middleton-in-Teesdale 20.6.1981 P.Skidmore.

Mesoleptus laevigatus (Gravenhorst, 1820). Frequent in Yorkshire.
Unconfirmed reports from VC61 by Fordham (1926 p117) and from VC62 by Roebuck (1877 p38; 1907 p214) and Morley (1907 p256). Reported from VC62 by Hincks & Dibb (1940 p175).
*VC61: Allerthorpe 4.8.1924 W.J.Fordham.
*VC63: Pinchwell Field, Wickersley 11.8.1978 M.Crittenden,D.W.Twigg.
*VC64: Askham Bog YWT NR 10 + 20 + 29 + 30.8 + 3.9.1950 J.H.Elliott.
*VC65: Middleton, Teesdale 21.6.1981 W.A.Ely.

Mesoleptus laticinctus (Walker,1874). Uncommon in Yorkshire.
*VC61: West End Farm 12-15.10.1984 P.Q.Winter.

*VC62: Ashberry Pastures YWT NR 8.6.1980 W.A.Ely.
†VC63: Holmehouse Wood 21.7.1940 J.Wood.
*VC64: Askham Bog YWT NR 13.8.1950 J.H.Elliott.
*VC65: Marske 29.6.2015 W.A.Ely.

Mesoleptus pronus (Förster, 1876). Rare in Yorkshire.
*VC63: Pot Riding Wood 22.10.1988 W.A.Ely.
†VC64: Crummack Farm 16.7.1983 W.A.Ely.
*VC65: River Tees, Winston 4.10.1985 W.A.Ely.

Mesoleptus vigilatorius (Förster, 1876). Uncommon in Yorkshire.
Reported from VC64 by Ely (2011a p215; 2012a p224; 2013b p227).
*VC61: Painsthorpe 21.6.1980 W.A.Ely.
*VC62: Harland Moor 18.8.2012 W.A.Ely.
*VC63: Old Cut Riverside 17.7.1943 J.Wood.
*VC65: Birk Gill, Colsterdale 2.9.1984 W.A.Ely.

Atractodes (Atractodes) arator Haliday, 1839. Rare in Yorkshire.
Reported from VC63 by Ely (2014b p42).

Atractodes (Atractodes) bicolor Gravenhorst, 1829. Uncommon in Yorkshire.
VC61: Stockendale Farm 25.6.1983 W.A.Ely (det R.Jussila).
*VC62: Low Mill + Chop Gate, Bilsdale 15.6.2013 W.A.Ely.
*VC63: Sandbeck Park Lower Lake 10.5.1981 W.A.Ely.
†VC64: Malham Tarn 14.9.1957 W.D.Hincks.
*VC65: Colsterdale 27.6.1981 W.A.Ely.

Atractodes (Atractodes) fumatus Haliday, 1839. Rare in Yorkshire.
Reported from VC65 by Ely (2011b p222).
*VC61: North Cave Wetlands YWT NR 13.8.2012 R.Crossley.
*VC62: Dalton Bridge 2.9.2011 W.A.Ely.
*VC63: Thorne Moors NNR 2012 H.R.Kirk.
*VC64: Crummack Dale + Crummack Farm 16.7.1983 W.A.Ely.

Atractodes (Atractodes) gilvipes Holmgren, 1860. Scarce in Yorkshire.
*VC61: North Cave Wetlands YWT NR 12.8.2011 + 17.7.2014 R.Crossley.
*VC62: Great Lake, Castle Howard 9.7.1988 W.A.Ely.
†VC63: Langold Lake 23.5.1981 W.A.Ely.
*VC64: Upper Dunsforth Carrs 1.6.2015 R.Crossley.

Atractodes (Atractodes) magnus Jussila, 2001. New to Britain.
†VC63: Scammonden Reservoir, Kirklees 11.8.2012 W.A.Ely (det R.Jussila).

Atractodes (Atractodes) obsoletor (Zetterstedt, 1838). Scarce in Yorkshire.
Reported from VC62 by Ely (2014a p222)..
*VC61: Jeffry Bog YWT NR 16.8.2014 R.Crossley.
*VC63: Holmehouse Wood 13.7 + 7.8.1940 J.Wood.
*VC64: Askham Bog 24.7.1943 W.D.Hincks.
*VC65: Hag Wood 20.6.2014 W.A.Ely.

Atractodes (Atractodes) pauxillus Förster, 1876. Rare in Yorkshire.
†VC63: Holmehouse Wood 14.10.1940 J.Wood.

Atractodes (Atractodes) pusillus Förster, 1876. Rare in Yorkshire.
Reported from VC63 by Ely (2014b p42).

Atractodes (Atractodes) tenuipes Thomson, 1884. Scarce in Yorkshire.
*VC62: Great Lake, Castle Howard 9.7.1988 W.A.Ely.
†VC63: River Don, Thrybergh 17.8.1980 W.A.Ely.

*VC64: Drax fuel ash tip 27.7.1987 W.A.Ely.
*VC65: Birk Gill, Colsterdale 7.7.1984 W.A.Ely.

Atractodes (Asyncrita) angustipennis Förster, 1876. Rare in Yorkshire.
Reported from VC63 by Ely (2014b p42).

Atractodes (Asyncrita) croceicornis Haliday, 1839. Rare in Yorkshire.
*VC61: Burstwick ex *Tipula paludosa* via *Siphona geniculata* 8. (em mid-9).1991 W.R.Dolling (det R.Jussila).
†VC62: Scar Wood 7.9.1986 W.A.Ely.
*VC63: Hail Mary Hill Wood, Treeton 7.7.1989 W.A.Ely.

Atractodes (Asyncrita) exilis Haliday, 1839. Rare in Yorkshire.
Unconfirmed report from VC62 by Morley (1907 p252).
*VC64: Hollins Hill 9.2012 H.Whiteley (det R.Jussila).

Atractodes (Cyclaulatractodes) helveticus Förster, 1876. Rare in Yorkshire.
†VC63: Blackmoorfoot Reservoir, Kirklees 3-21.9.1985 D.Maude (det R.Jussila).

Acknowledements
Many of the C19th and C20th records listed in this series are based on specimens preserved in the collections of Sheffield, Rotherham, Doncaster, Nottingham, Yorkshire, Leeds and Manchester museums, the Natural History Museum, London, the World Museum, Liverpool, and the National Museum of Scotland, Edinburgh. I am grateful to the curators of all these collections for access to their specimens. C21st specimens have mainly been passed on by their collectors, who are credited accordingly.

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All Creatures: an exhibition at Scarborough Art Gallery

9th July to 25th September 2016
Curated by artist Mark Hearld

Objects from Scarborough's natural history collection.

This is a splendid example of what can be done with a collection of Natural History specimens within an Art Gallery context. This visually exciting exhibition highlights some of the many examples of birds and mammals held within the Trust's collections. These include examples of specimens lost to local natural historians with the closure of the displays at Wood End Museum in Scarborough.

Contact: Gallery@SMT.uk.com Tel:01723 374753

Field Note: Vagrant Emperor in Hessle

Barry Warrington
Email: treasurer@ynu.org.uk

On the morning of 11 October 2015, the rare Vagrant Emperor dragonfly *Anax ephippiger* was recorded from the author's garden in Hessle, East Yorkshire (VC61). This dragonfly, from sub-Saharan Africa and the Middle East, is known to be a long-distance vagrant and may sometimes appear in the UK during the winter months.

The overall appearance of both sexes is that of a golden sandy-brown insect, which can often look fairly pale from a distance (Plate 5, centre pages). The costae are yellow and the pterostigmata are long and brown. The upper part of the eye is brown while both the hind margins and underside are yellow. The male Vagrant Emperor has a distinctive blue saddle on top of the second abdominal segment whereas in the female and immature specimens this is brownish-violet. These features confirmed that the individual was a female Vagrant Emperor, likely a very mature one owing to its darkness and faded saddle markings (J. Bowers pers. comm.). The overall impression of the Vagrant Emperor is of apparent shortness - it is 61 to 66mm long, compared to the more familiar Emperor *Anax imperator* which can be over 80mm.

Many of the c.17 confirmed British sightings prior to 1998 were during our winter months when a brown hawker dragonfly on the wing can only really be of this species. The record was verified by British Dragonfly Society County Recorder, Paul Ashton, and constitutes the first record for East Yorkshire (VC61) and only the third confirmed record for Yorkshire as a whole.

Notice: YNU Annual General Meeting

The next Annual General Meeting of the Yorkshire Naturalists' Union will be held in the **Aislabie Suite at Fountains Abbey, Ripon**, on **Saturday 5th November 2016**.

The day will start with registration and refreshments at 10.30am, followed by a meeting of the Natural Sciences Forum.

A buffet lunch will be served in the main restaurant, followed by tea and coffee in the Aislabie Suite.

The AGM will take place after lunch, starting with a welcome address by the Lower Ure Conservation Trust. This will be followed by the presidential address entitled "**Nosterfield - searching for inspiration!**" from the outgoing YNU President, Mr Simon Warwick.

The meeting will close at 4pm. Please see the YNU website to download the agenda.

The price is £14 per person to cover lunch and refreshments.

Bookings should be made via the YNU website.

Plate 1. Fen Violet *Viola stagnina* (see pp81-86).
Top left: Cultivated plant descended from wild ancestors.
Top right: Seed capsules and a cleistogamous flower (top centre). *Ian McDonald*
Lower: Herbarium sheets showing specimens collected from Hatfield Moors (left) and Thorne Moors (right) by William Bunting in July 1964. With permission from Doncaster Heritage Services (Museum).

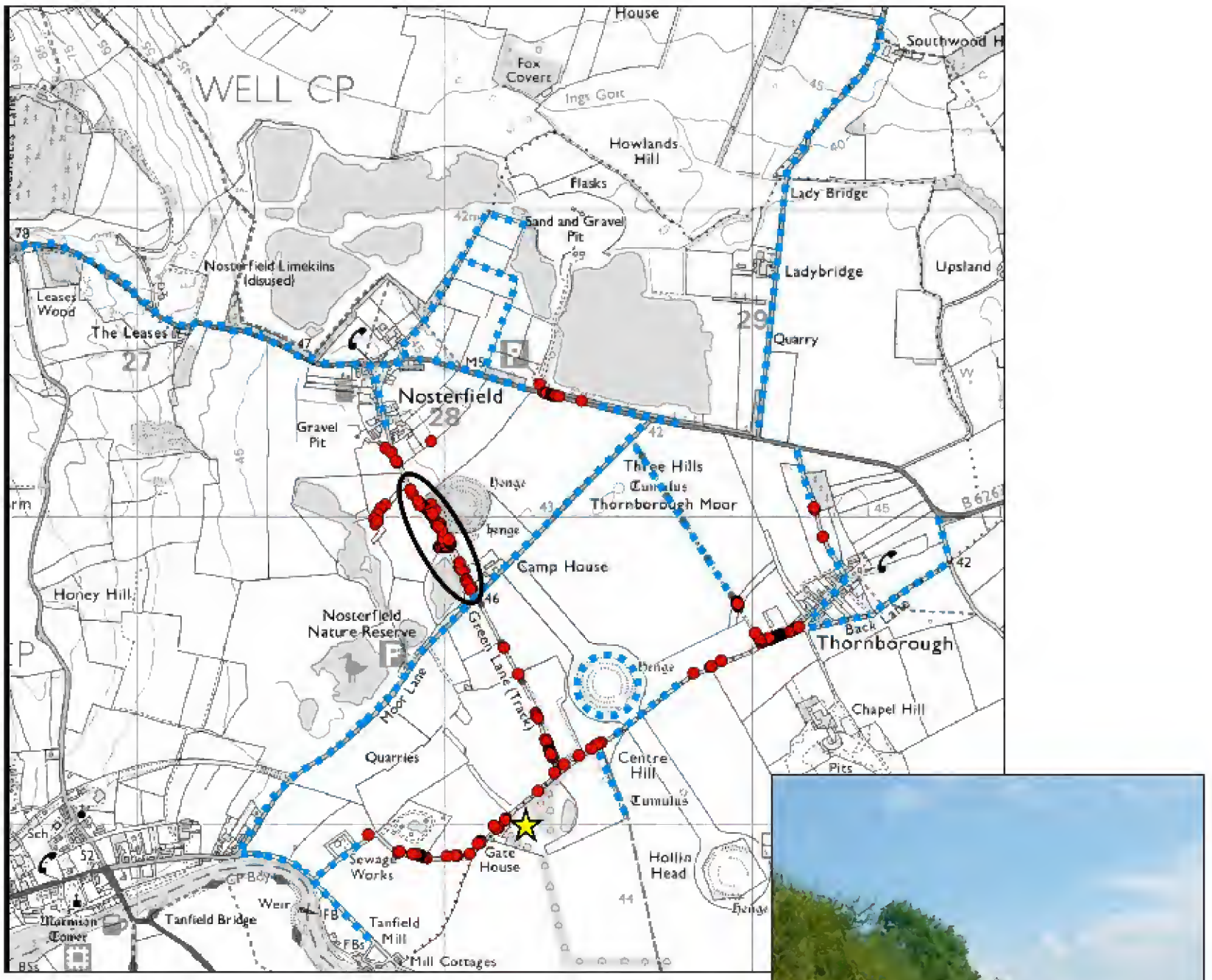

Plate 2. Bloody-nosed Beetles *Timarcha tenebricosa* (see pp87-95).
Above: Map showing the study area around Nosterfield village. Key: red symbols = GPS-located beetles; blue dotted lines = surveyed verges where no beetles were found; yellow star = the site of the original *Timarcha* record; black ellipse = the area of the mark-release-resighting study. Map © Crown Copyright/database right 2016. An Ordnance Survey/EDINA supplied service.
Right: A habitat view of the section of the Nosterfield Nature Reserve used for the mark-release-resighting studies. *S. Warwick*
Below: Larva and marked adult beetles. *G. Oxford*

Plate 3. The Genus *Campsicnemus*. *Campsicnemus magius* male (see p99), painted by the late Dr Peter Skidmore. © Thorne & Hatfield Moors Conservation Forum.

Plate 4. Leafmining moths in VC61 (see pp101-104). *Top left:* Pale Thistle Case-bearer *Coleophora peribenanderi* on Creeping Thistle *Cirsium arvense*. *Top right:* Mines of Dewberry Pigmy *Ectoedemia rubivora* on *Rubus* sp.

A.D.Nunn

Lower left: Mines of Flame Neb *Chrysoesthia drurella* on Common Orache *Atriplex patula*. *Lower right:* Adult Flame Neb ex larva.

B. Warrington

Plate 5. Vagrant Emperor *Anax ephippiger* in a Hessle garden (see p120).

B. Warrington

Plate 6. Urban peat (see pp121-127).
Sampling the peat deposit- from the roof of an outbuild- ing following removal of ivy; limestone chippings from the roof surface are present.

G. Swindles

Plate 7. Woodlands of N.E Yorkshire (see pp127-134).
Below left: Large bed of Wood Anemone *Anemone nemorosa*, Low Gill 10.05.2013
Below right: Ash-black slug *Limax cinereoniger*. Fully extended length approx.150mm. Lazenby Bank 19.08.2012.

A.A.Wardhaugh

The phenomenon of urban peat formation

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Introduction

Peatlands cover an estimated 3% of the global land mass and contain approximately a third of all the organic soil carbon on Earth (Gorham, 1991). It has been estimated that peatlands contain c.600 gigatonnes of carbon (Gt C), which is more than all the vegetation on Earth (c.560 Gt C) (Turetsky *et al.,* 2015). The greatest concentration of peatlands globally can be found in the temperate and boreal regions of North America and Eurasia (e.g. Charman *et al.,* 2013). However, peatlands are also found in tropical areas in the form of swamps and ombrotrophic domes (e.g. Page *et al.,* 2011). Although peat is composed primarily of organic matter and water, it should not be considered a single soil type owing to differences in organic and inorganic content, plant composition and chemistry.

Peat is composed of partly decomposed vegetation and forms when the production of plant litter is greater than its decomposition. However, the mechanisms responsible for peatland initiation and lateral expansion are relatively poorly understood (Belyea and Baird, 2006). Most research has focused on the development of natural peatlands over millennial timescales during the Holocene and late Pleistocene, using radiocarbon dating to constrain the ages of basal peats (MacDonald *et al.,* 2006; Yu *et al.,* 2010; Zhang *et al.,* 2015). However, it might be possible to observe early peat initiation in the present day in locations where production of litter outstrips decomposition. In this study, the accumulation of a thin layer of peat on a flat roof provides the opportunity to study the contemporary development of new peat formed within the last few decades. To our knowledge, the phenomenon of urban peats has been entirely unstudied.

Study site

Our study site is the roof of an outbuilding in a terraced house: 5 Newton Terrace, York, England (Plate 6, centre pages). The structure was built in the late 19th century when a new sewer was laid down in Newton Terrace. During World War II the outbuilding was converted into an air-raid shelter through the addition of a reinforced concrete flat roof. Andrew Jones (author) bought the house in 1983 and the roof was improved through the addition of a layer of roofing felt, tar and gravel (limestone chippings). At the same time a cypress tree was planted adjacent to the structure and Ivy *Hedera helix* was allowed to grow across the roof. In 2007 the cypress tree was cut down, and the Ivy was removed from the roof. We then noticed that an extensive organic deposit had accumulated across the roof, patchily covered in moss. The peat had accumulated between 1983 and 2007 (24 years) and was 4cm thick in the margins (minimum accumulation rates 6 yr cm^{-1}, depending on length of time before initiation), and between 6-10cm (2.4 - 4 yr cm^{-1}) thick in the centre.

Method

We took 44 samples of peat from random locations across the roof and placed them in sample tubes. The samples were returned to the laboratory and stored at 4°C until further analysis. Bulk density, moisture content and loss-on-ignition analyses were carried out on the peat samples following Chambers *et al.* (2010). After loss-on-ignition, ash samples were sieved at 63□m to determine the sand component. We undertook pollen and testate amoeba analysis on one sample. We extracted pollen from the peat using the technique of "sieving and swirling", which has been shown to work well for peats and organic lake samples (Hunt, 1985). Pollen was identified using Moore and Webb (1978) and a collection of pollen type slides. Description of vegetation follows Bennett *et al.* (1994) and Stace (2001). Samples were prepared for testate amoeba analysis following Booth *et al.* (2010) and analysed for humification using the von Post method (von Post & Granlund, 1926). Carbon and nitrogen analysis was carried out using an Elementar Micro Cube Combustion Analyser at the University of Leeds. Three samples were ground in mixer mill for 4 minutes at 30Hz prior to analysis and weighted into tin capsules. Calibration was checked using Energy Peat NJV942 and B2150 High Organic Sediment standards.

Results

Loss-on-ignition data verify that the material on the roof can indeed be considered peat, being composed primarily of organic material (61-68%; mean = 64%; *n* = 44) (Figure 1). Bulk density was generally high (0.16-0.21g cm^{-3}; mean = 0.18g cm^{-3}; *n* = 44) (Figure 1); ash-free bulk density was considerably lower (0.10-0.14g cm^{-3} organic mass; mean = 0.12g cm^{-3}; *n* = 44). All samples were categorised as H7 in the von Post classification (highly decomposed peat containing a lot of amorphous material with very faintly recognisable plant structure).

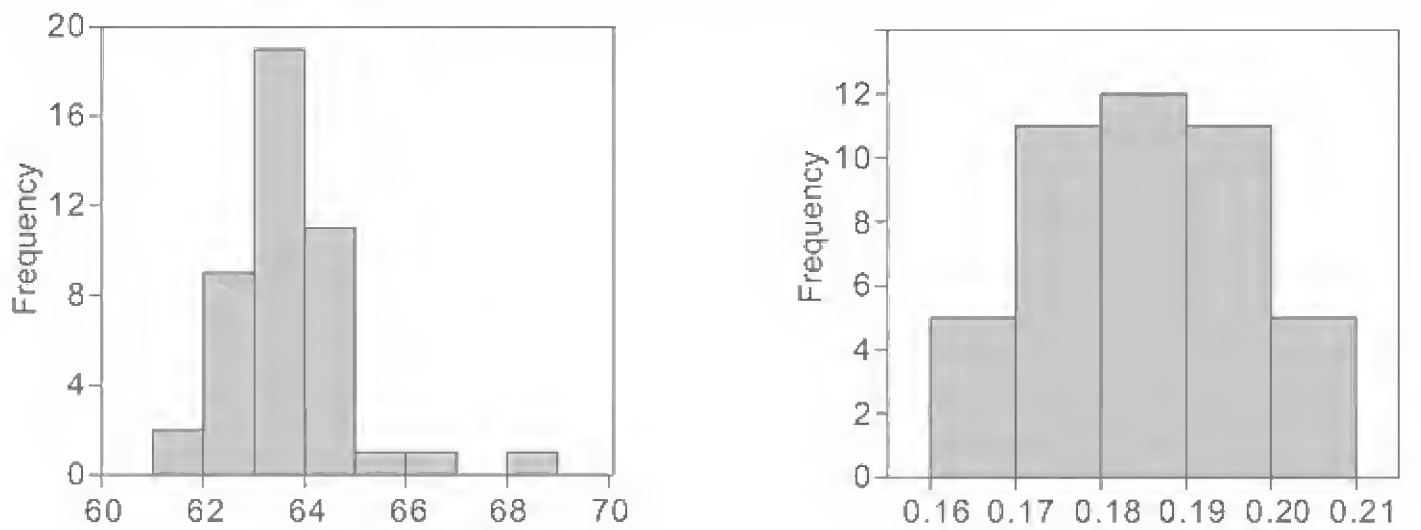

Figure 1. Loss-on-ignition (%) and dry bulk density data from the urban peat deposit.

The peat has a mean moisture content of 42.5% (range 41.4-43.3%). The inorganic ash content in the peat was determined to have a mean sand (> 63□m) content of 6.4% (range 2.6-10.3%), derived from the roof material. Bulk carbon (C) content was determined to be 29-32% by dry weight (mean = 30%; *n* = 3); nitrogen (N) content was 1.9-2.1% (mean = 2.0%; *n* = 3). C/N ratio was 14.2-16.1% (mean = 14.9%; *n* = 3). When C content was corrected for inorganic ash, it rose to 42.6-52.5% (mean = 46.9%, *n* = 3).

The peat deposit also contained abundant small snails, woody remains, Ivy leaf fragments and occasional flecks of plastic. Well-preserved in the peat were abundant pollen grains, spores, and testate amoebae (single-celled animals with a shell or 'test' which represent sensitive hydrological indicators in peatlands). The pollen assemblage was dominated by Scots Pine *Pinus sylvestris*, spruce, Ivy and grass (Table 1). The most common testate amoebae encountered in the peat include *Trinema lineare*, *Difflugia* spp., *Assulina muscorum* and *Euglypha rotunda* type (Table 2).

Table 1. Pollen and spore data from the urban peat deposit (total count = 370). Other microfossils found during the analysis are shown.

Pollen or spore taxa	**Number of grains**	**Percentage**
Scots Pine *Pinus sylvestris*	100	27.0
spruce	70	18.9
Ivy *Hedera helix*	59	15.9
grass	56	15.1
Holly *Ilex aquifolium*	22	5.9
Yew *Taxus baccata*	8	2.2
dogwood	7	1.9
Horse Chestnut *Aesculus hippocastanum*	6	1.6
elm	6	1.6
Hornbeam *Carpinus betulus*	4	1.1
oak	4	1.1
Convolvulus	4	1.1
birch	3	0.8
Hazel *Corylus avellana*	3	0.8
Alder *Alnus glutinosa*	2	0.5
Juniper *Juniperus communis*	2	0.5
Artemisia	2	0.5
Dandelion *Taraxacum* agg.	2	0.5
mint	2	0.5
dock	2	0.5
Hawthorn *Crataegus monogyna*	1	0.3
heath	1	0.3
Fat-hen *Chenopodium album*	1	0.3
Meadowsweet *Filipendula vulgaris*	1	0.3
Ribwort Plantain *Plantago lanceolata*	1	0.3
buckler fern	1	0.3
Others (number counted)		
Cosmarium (algae)	22	
Fly ash (spheroidal carbonaceous particles)	21	
Asphalt < 21 µm	50	
Asphalt 21-50 µm	61	
Asphalt > 50 µm	40	

Table 2. Testate amoeba data from the urban peat deposit (total count = 230).

Testate amoeba taxa	Number of specimens	Percentage
Trinema lineare	63	27.4
Difflugia spp.	47	20.4
Assulina muscorum	27	11.7
Euglypha rotunda type	26	11.3
Trinema enchelys	14	6.1
Difflugia pristis	13	5.7
Euglypha strigosa	9	3.9
Tracheuglypha dentata	8	3.5
Cryptodifflugia oviformis	7	3.0
Difflugia oblonga	4	1.7
Centropyxis cassis	4	1.7
Archerella flavum	2	0.9
Cyclopyxis arcelloides type	2	0.9
Assulina seminulum	1	0.4
Euglypha tuberculata	1	0.4
Degraded tests	2	0.9

Discussion

The organic matter threshold commonly taken as the defining characteristic of peat varies between 30% (Joosten & Clarke, 2002), 50% (Andriesse, 1988) and 65% (Rieley & Page, 2005). In the USDA Soil Taxonomy, histosols are defined as having at least 20-30% organic matter in the upper 80cm of the soil (USDA, 1999). The mean organic matter content of our samples (64%) suggests that they qualify as peat under all of these definitions apart from one - Rieley and Page (loc.cit.). The bulk density of our samples is also well within the range that would be expected for well-humified peats (e.g. Stanek & Silc 1977; Chason & Siegel, 1986; Parry & Charman, 2013).

The uncorrected C content of our peat is lower than that commonly reported from natural peatlands, which often have a C content of ~50% (e.g. Parry and Charman, loc.cit.). However, the lower carbon content of our samples relates to the peat incorporating materials from the roof as it accumulated. When the C content is corrected for ash fraction the values are more akin to natural peat. However, under some definitions even the uncorrected C content is within the defined bracket of what constitutes peat (e.g. Agus *et al.* (2011) suggest that peat is defined as comprising at least 18% organic C content and organic matter content of more than 30%). The presence of asphalt fragments relates to degradation of roofing materials and incorporation of these into the peat during accumulation (Table 1). We hypothesise that C content of the urban peat will increase over time as its phreatic connection to the parent material in the roof weakens. In future the peat may become truly ombrogenous (i.e. separated from the mineral substrate, and dependent on rain water solely for mineral nutrients).

Shading, wet conditions, an impermeable roof surface, and a high litter input from the cypress tree have led to peat formation. In terms of peat formation processes our deposit has some similarities to the earliest stages of blanket peat formation where acid peat can form in wet hollows as well as over large expanses of undulating terrain owing to high rainfall and low levels of evapotranspiration (cf. Gorham, 1957). It can therefore be considered a process of paludification – the structure of the roof has led to waterlogging in the soil and a reduction of decay rate significantly below that of production.

A small number of plants in the pollen list were not present in the garden (e.g. birch, Scots Pine and Yew) but do grow in the vicinity, as reported in a local vegetation survey (Bishophill Botany Group, 2013). The presence of algae in the pollen sample suggests very wet conditions in the deposit for at least part of its developmental history. The presence of fly ash (spheroidal carbonaceous particles or 'SCPs') in the peat most likely relates to high-temperature combustion in electricity generation (Swindles, 2010); there are several power stations in Lancashire, Cheshire and Yorkshire where these particles could have originated. SCPs have been suggested as an important marker of the proposed Anthropocene epoch (Swindles *et al.,* 2015), so it is interesting to note the presence of this stratigraphic marker in an urban peat. Coal and oil-derived SCPs could be differentiated within the profile to further elucidate the timing of peat development; the abundance of coal-derived SCPs would have declined in recent decades.

The testate amoeba taxa present in the urban peat are very commonly found in the natural peat bogs of Yorkshire (e.g. Turner & Swindles, 2012; Turner *et al.,* 2013). The presence of wet-indicator taxa (e.g. *Archerella flavum*, *Difflugia oblonga* and *Difflugia pristis*) alongside dry-indicator taxa (e.g. *Assulina muscorum*, *Euglypha rotunda* type and *Trinema lineare*) suggests that hydrological conditions on the roof have varied between very dry to very wet in the last 24 years.

Our results show that under favourable conditions peat can form in urban environments. We wonder how common urban peats are across the world, including those formed from herbaceous litter (such as at our site) but also accretion of mosses. Peats formed within human timescales, possibly in unusual locations such as ours, have the potential to reveal new insights into peat initiation and accumulation. Furthermore, they represent archives of recent environmental conditions that have the potential to yield important high-resolution records of human activity and urban environmental change in the Anthropocene.

Acknowledgements

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Woodlands of the Ormesby to Wilton areas, N.E. Yorkshire: some observations on their terrestrial molluscs and flora

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Introduction

The Nature Conservancy Council (now Natural England) produced a series of inventories of ancient semi-natural woodland during the late 20th century. One of these covered the Cleveland area of north-east Yorkshire (Cooke, 1987), i.e. the administrative county that existed between 1974 and 1996. Ancient semi-natural woodlands are defined as those which have had a continuous tree cover since at least 1600 AD, although probably for much longer, and now bear stands of trees which are not obviously planted. In contrast, tree plantations established on previously cleared land are termed secondary woodlands, many having their origins in the 18th and 19th centuries as cover for game. Inevitably this division of woodlands into two categories is somewhat simplistic. Nonetheless, the compilation of ancient semi-natural woodland inventories was of considerable value from a conservation viewpoint because these are likely to be of higher biodiversity than woods of a more recent origin. At the time of their production the inventories were envisaged as provisional documents. They

were based largely on cartographic evidence and included only woodlands of over 2ha in area, doubtless at least in part because smaller woodlands were often not represented on older small-scale maps, making their assessment difficult. In view of this, the possible ancient status and conservation value of smaller woodlands could remain overlooked and those deemed to be secondary on cartographic evidence could, perhaps, contain some ancient pockets. It is with this background in mind that the present investigation of a series of smaller woodlands in the northern part of north-east Yorkshire (VC62) was carried out.

A number of ancient semi-natural woodlands listed in the inventory noted above, and in the inventories for nearby parts of north-east Yorkshire (Carter, 1987a, 1987b), have been investigated in the past (Wardhaugh, 1996, 1997a and unpublished data). They were found to have certain flowering plant and mollusc species associated with them, i.e. often present in these woods but generally not found in woodlands in this region that are thought to be secondary. The presence of these species, often termed indicators, seems to be of at least some predictive value with respect to biodiversity because the same woodlands were found to have more terrestrial mollusc species in total when compared with secondary woodlands. Moreover, there is some evidence to suggest that this pattern extends to other taxa (see article entitled 'Gills and Becks: the Ancient Woodlands of north-east Yorkshire' at www.clevelandnats.org.uk, in the section on Wildlife of the Area). The series of woods forming the subject of the present investigation was, therefore, surveyed in a similar manner in the hope that this might shed some light on their potential value for wildlife.

Methods

Basic details about the woodlands investigated are provided in Table 1.

Table 1. The woodlands investigated.

Site number	Site name	Grid reference	Approximate area (ha)	Approximate altitude (m)
1	Low Gill	NZ526168	4	40
2	Lodge Gill	NZ523167	5	35
3	Ormesby Wood	NZ529174	7	35
4	Crow Wood	NZ535163	4	70
5	Spring Clump	NZ532160	1.5	70
6	West Wood	NZ543167	1.5	70
7	Cross Wood	NZ544169	1	65
8	Great West Plantation	NZ546166	7.5	100
9	Woodcock Wood	NZ550160	5	80
10	Ten Acre Bank	NZ555164	15	170
11	Rye Hill Wood	NZ553167	5	110
12	Clapham's Wood	NZ565164	3	150
13	Lazenby Bank	NZ575190	26	100
14	Castle Bank Wood	NZ582193	11	120

The underlying superficial (or drift) geology is largely boulder clay with occasional bedrock exposures of Lias mudstone, marl, shale and sandstone. Dominant trees are Ash *Fraxinus excelsior*, oaks and Sycamore *Acer pseudoplatanus* with some Beech *Fagus sylvatica*. Only Castle Bank Wood is listed as ancient semi-natural by Cooke (1987). All of the woods are present on the first edition Ordnance Survey maps of 1894 (25 inches per mile). A leaflet describing the woodlands of the Ormesby Hall estate (numbers 1-5, Table 1) states that they are first mentioned in records dated 1779 (Armstrong et al., 1992).

In addition, the occurrence of seven species of herbaceous flowering plant was recorded. These were Wood Anemone *Anemone nemorosa*, Wood-sorrel *Oxalis acetosella*, Yellow Pimpernel *Lysimachia nemorum*, Woodruff *Galium odoratum*, Wood Speedwell *Veronica montana*, Great Wood-rush *Luzula sylvatica* and Pendulous Sedge *Carex pendula*. The principal basis for the selection of these was a list of plants produced by Peterken (1981), stated to have a strong affinity for ancient woods, showing little or no ability to colonise secondary woodland and rarely being found in other habitats. Peterken's list contains 34 species and is based on work carried out chiefly in Lincolnshire. The rationale for selection from this list is that these species have been shown to have at least some association with ancient semi-natural woodland in this region (Wardhaugh, 1997a). They have the advantage of being fairly common and conspicuous; thus it has been comparatively easy to establish either their presence or very likely absence from a wood, the latter with a fairly high level of confidence. Wood Speedwell from Peterken's list was not included in the previous study (Wardhaugh, 1997a). It was added because Sykes (1993) states that "its distribution shows a correlation with that of ancient woodland" in North Yorkshire. It was felt that inclusion of another fairly widespread species would be of value when investigating comparatively small woodlands where the precise habitat requirements for some of the other species involved could conceivably be lacking and result in their absence, regardless of woodland age or overall biodiversity.

Nearly all the records presented here were collected during the period 2010 to 2015. A few records of terrestrial molluscs (less than 5%) predate this period but are included in order to present species lists which are as complete as possible (see Appendix on the YNU website at http://www.ynu.org.uk/downloads/naturalist).

Results

A summary of the results is provided in Table 2. Woodruff and Yellow Pimpernel were not located in any of the woodlands. The English Chrysalis Snail and the Ash-black Slug, found at some of the sites, are considered to have an association with ancient semi-natural woodlands (Kerney & Stubbs, 1980; Wardhaugh, 1997a, 2000). A full list of molluscs located is provided in the Appendix to this article on the YNU website.

Table 2. Plants and terrestrial molluscs recorded.

	Woodland													
Flora	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Wood Anemone *Anemone nemorosa*	/		/											
Wood-sorrel *Oxalis acetosella*	/								/	/	/		/	/
Wood Speedwell *Veronica montana*		/	/			/	/						/	/
Pendulous Sedge *Carex pendula*	/	/	/	/	/									/
Great Wood-rush *Luzula sylvatica*														/
Molluscs														
English Chrysalis Snail *Leiostyla anglica*									/				/	
Ash-black Slug *Limax cinereoniger*											/	/	/	/
Total mollusc species	22	21	18	16	24	24	19	29	34	17	23	26	31	33

Discussion

Assessment of the results is complicated by a number of factors which need to be borne in mind when trying to make an overall assessment of any particular woodland. Firstly, woodlands vary in size and there is some evidence that this can influence the number of mollusc species present (Wardhaugh, 1996). The size range of woodlands in the present survey was 1 to 26ha (Table 1) but there was no statistically significant association between woodland size and number of species present (Spearman's rank correlation coefficient: r_s (12) = 0.1907, p = 0.258). Secondly, moisture is of great importance for molluscs, so a woodland with permanently damp areas, even if these are quite small, is likely to harbour more species than one which is relatively dry throughout. A third, more general point, is that the classification of woodlands as ancient or secondary is inevitably a simplification. The former may have been partly or completely felled and replanted, may have been used for grazing livestock or disturbed by mineral extraction. Clearly such histories could have influenced the present day biodiversity. Woodlands deemed secondary could be composite in nature, with older (less disturbed) pockets of long continuous tree cover (not necessarily ancient trees) within them acting as reservoirs for species which may (or may not) have been able to spread out and colonise the newer surrounding woodland. Every woodland will have its own unique history and at times the distinction between ancient and secondary may not be clear cut. With respect to secondary woods, the likelihood of any particular species colonising these will not be equal for all woods in an area. Nor is colonisation of any given wood equally likely by all locally occurring species of any taxonomic group. In this respect there are parallels with the island theory of biogeography as developed originally by MacArthur & Wilson (1967);

woodlands are small and isolated islands in hostile environmental seas. See e.g. Watts (2006) for how this concept applies to woodland.

To set the results of the present study in context, comparison with other nearby sites is necessary. Of these, the most species-rich have populations of all or most of the seven flowering plant species noted above and at least 32 but sometimes well over 40 terrestrial mollusc species, including typically three to five which are considered to be associated with ancient semi-natural woodland (Kerney & Stubbs, *op. cit.* ; Wardhaugh, 1997a). For example, Wilton Wood (NZ5819 & NZ5919), just east of the study area, has at least six of the flowering plants and 40 species of terrestrial mollusc, including five ancient semi-natural woodland indicators (Wardhaugh, 1997b). For Mill Bank Wood, Kildale (NZ5909 & NZ6009), the figures are seven, 48 and five respectively (Wardhaugh, unpublished data). Both are considered to be ancient semi-natural. None of the woodlands covered in this survey stands out as biodiverse in this context (Table 2 and Appendix). Castle Bank Wood is one of the richest with four of the seven plants and 33 known terrestrial mollusc species, including the Ash-black slug. The presence of Wood-sorrel and Great Wood-rush suggests acidic soil in places while Pendulous Sedge suggests more base-rich, heavy conditions elsewhere in the wood (Lawrence, 1994). A varied soil pH may result from its ravine-like topography with a variety of strata cut through by stream action. The apparent absence of Wood Anemone from this site is perhaps of significance because Spencer (1990) considers it to be one of the better indicators of ancient semi-natural woodland across much of Britain.

The flora: Wood Anemone has been found at only two of the 14 sites. At Low Gill it occurs in large beds (see Plate 7, centre pages), suggesting long establishment in an undisturbed location (Spencer, op. cit.). Wood-sorrel and Pendulous Sedge also occur at this site but the molluscan fauna is unexceptional with only 22 species recorded, none of which is associated with old woodland. In Ormesby Wood just one small clump of Wood Anemone has been located. Nearby are a few almost evenly spaced small patches of Goldilocks Buttercup *Ranunculus auricomus*, another flowering plant which occurs more usually in old woodland. Perhaps these two species are recent deliberate introductions? As an aside, in any study such as this, the converse should be borne in mind, i.e. the possibility that in the past attractive plant species such as Wood Anemone could have been removed by collectors. However, it is perhaps unlikely that any of the species under consideration in this article could have been completely eliminated from even a small woodland in this way.

The inclusion of Wood Speedwell in this survey provided intriguing information. It was present at two sites which have relatively high numbers of mollusc species (Castle Bank Wood and Lazenby Bank) but also in four other woodlands with more modest molluscan faunas. At two of these (West Wood and the adjacent Cross Wood) it was the only flowering plant species noted in this survey (Table 2).

Mollusca: The English Chrysalis Snail is present in two small colonies known since the mid-1980s, one in Woodcock Wood and the other at Lazenby Bank (NZ54901710 and NZ57161911 respectively). The sites are wet, well-vegetated and relatively undisturbed areas within these woodlands, its typical habitat (Kerney & Cameron, 1979; Kerney, 1999). These two populations are of some significance because the UK has a very large proportion of the world population of the English Chrysalis Snail (Wynne, 1993). The Ash-black Slug (see Plate 7, centre pages) has been found predominantly, but not exclusively, in ancient semi-natural woodland elsewhere in the region (Wardhaugh, 2014). In the present survey it was located in four woodlands all in the east of the area (Rye Hill Wood, Lazenby Bank, Castle Bank Wood and Clapham's Wood), usually at rest by day beneath larger pieces of fallen timber, notably at Lazenby Bank where a good deal of this material exists at present. Two additional snails that seem to have some association with areas of long continuous tree cover in the local area are the Plaited Door Snail *Cochlodina laminata* and Copse Snail *Arianta arbustorum* (Wardhaugh, 1997a and unpublished data). The former was recorded at Castle Bank Wood only; the latter there and also at Lazenby Bank.

Other molluscs worthy of comment include the Lesser Bulin Snail *Merdigera obscura*, found only in a small area of Lazenby Bank (NZ57181904) and not common locally (See 'A List of the Mollusca of the Cleveland District' at www.clevelandnats.org.uk in the section on Wildlife of the Area), and the Silver False-keeled Slug *Arion circumscriptus silvaticus* (at one time regarded as a separate species from the Dotted Slug), recorded only from Woodcock Wood. The Green Cellar Slug *Limacus maculatus* appears to be a recent colonist in the study area. Formerly a synanthropic species, it has begun to establish itself away from human habitation in locations such as woods and farmland at a national level (Rowson et al., 2014). It was first recorded in the study area in 2011 at Lodge Gill and so far it has also been found in two nearby woodlands (Low Gill and Spring Clump), a nearby park and suburban garden. The Blue-black Soil Slug *Arion hortensis* is another species which appears to have increased its range in the local area quite recently.

Conclusions

The sites found to have the most species-rich terrestrial molluscan fauna are Woodcock Wood (34 species), Castle Bank Wood (33) and Lazenby Bank (31). Castle Bank Wood was found to have four of the seven flowering plant species included in the survey, the most recorded at any one site. However, in none of these woods was Wood Anemone found, the species having possibly the closest association with ancient semi-natural woodland. Of the three, Castle Bank Wood is the only one considered to be ancient by Cooke (1987). Set against the examples described earlier of the most species-rich woodlands in the area, these three sites appear to occupy a somewhat intermediate position. A fourth site, Low Gill, is enigmatic in having quite extensive beds of Wood Anemone, with Wood-sorrel and Pendulous Sedge also present, but seemingly an unexceptional molluscan fauna. Every woodland, as might be expected, is different.

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Postscript

At the time of writing the landscape adjacent to several of these woodlands is about to change. Planning consent has been given for housing to be built on arable farmland on the north-east side of Low Gill (centred on NZ527159) and for a large development on mixed

farmland on the western side of West Wood (NZ540168). Application has also been made to build 400 houses on an area of grassland and scrub, not farmed since at least the mid-twentieth century, on the northern edge of what is currently known as Flatts Lane Country Park, and bounded by West Wood, Cross Wood, Woodcock Wood and Great West Plantation (NZ545158).

Fundraising campaign to create new pollinator-friendly habitat in York

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Join us in securing the future of pollinators in York

Adventurer Steve Backshall, York's MP Rachael Maskell and local wildlife experts have thrown their support behind a campaign to raise £5,000 in support of York Urban Buzz – can you help too? The project promises to create 100 'buzzing hotspots', making York's parks and gardens more bee-friendly to give bees, butterflies and other pollinating insects a helping hand. However, the project needs £5,000 to fully realise its ambitions.

Project aims

York Urban Buzz will create 25 hectares of new pollinator habitat - 80 'Buzzing Hotspots', which are new areas of pollinator-friendly habitat at 0.5ha or less, and 20 'flagship buzzing hotspots' which will be 0.5ha or greater. Each site is carefully selected for 'pollinator potential' by identifying existing habitat features and areas of importance for pollinators, such as shelter or nesting sites, type of forage available and the level of management the site receives. Areas such as Rowntree Park, Rawcliffe Meadow, York City Walls and West Bank Park have already been selected as Buzzing Hotspots to ensure they are flower-rich with a range of nesting opportunities, at the same time making them beautiful and inspiring places benefitting York residents and for visitors to enjoy.

At the centre of this project is collaboration. We have renowned Hymenopterist Michael Archer on the steering group as well as representatives from York City Council, Yorkshire Wildlife Trust, St Nicks, Fera, North and East Yorkshire Ecological Data Centre and the Poppy Road Project. With such a highly skilled and influential steering group we are aiming to create innovative habitat for pollinators, including new wildflower meadows, fruit trees for bees, bee banks, edible hedges and areas of formal planting. We are looking at changing management regimes to ensure that the new habitat created at the heart of York's greenspaces is maintained in the future. In addition to this we are working alongside the community, tapping into the plethora of skill and enthusiasm in York's 'friends of' and volunteer groups. All Buzzing Hotspots must be accessible to the public and we are offering training to interested people on habitat creation and management. By the end of the project 100 volunteers will have been recruited to act as site champions, 600 volunteers and land

managers will have been trained to create and manage pollinator habitat and 10,000 local people will be engaged through the media.

Why pollinators?

So, what do we mean when we talk about pollinators? Pollinators include bees, butterflies, moths, beetles, wasps, flies and you might be surprised at how many species are involved – at least 4,000 in Britain! It is though now evident that pollinators have been declining year on year. Three of our bumblebee species have already become extinct and a further eight have undergone serious declines (Goulson, 2010); 65% of our moths (Burns *et al.,* 2012) and 76% of the UK's resident and regular migrant butterflies have declined in either abundance or occurrence (or both) (Fox *et al.,* 2015). The Short-haired Bumblebee *Bombus subterraneus* and Essex Emerald moth *Thetidia smaragdaria* are two that we have lost in recent decades from the UK.

A big factor behind these declines is loss of habitat; across Britain an enormous 97% of wild flower meadows have been lost, essentially making our pollinators homeless. However, there is some light at the end of the tunnel. Recent work on urban pollinators by Bristol University, under the Insect Pollinator Initiative (IPI), clearly demonstrated that there are opportunities to provide habitat for pollinators in urban areas. Developing these opportunities would provide stepping stones for pollinators, allowing them to move and disperse through urban greenspace and the wider landscape. The work done by the IPI on urban areas showed urban areas are able to support good populations of insect pollinators, act as important source areas, refuges and corridors of favourable habitat within a hostile matrix of habitat such as intensive agricultural landscapes (Baldock *et al.,* 2015).

Urban opportunities

While there has been increasing interest in enhancing agricultural areas for pollinators, far less attention has been paid to how urban areas can be made more pollinator-friendly. The Bristol University work identified that as urban areas are widespread and increasing pressures on natural areas for food and biofuel production are likely, identifying good urban habitats for pollinators and improving their value for pollinators should be part of any strategy to conserve and restore pollinators.

This new research, combined with Michael Archer's knowledge, puts us in an excellent position for habitat creation in York. Michael Archer has been closely monitoring York's Hymenoptera populations for many years, looking at their distribution and requirements. He reviewed the Hymenoptera of urban York, finding that since the 19th century a total of 176 species had been recorded and currently around 169 species have been recorded, which represents about half of all the aculeate species found in Yorkshire (Archer, 2012).

Plans in York

Greenspace in York is varied, consisting of fen woodland, unimproved pastures, winter-flooded meadows, parks and gardens, brownfields and small sites surrounded by residential housing (Archer, *op.cit.*). This project will ensure that Buzzing Hotspots provide the missing resources so that York's greenspace provides the resources that pollinators need year round. For example, Archer (*op.cit.*) states that the main requirements of aculeates are food sources

and nesting sites besides overwintering, sunning, mating sites and, sometimes, building materials to make their nests. Bees require flower-rich areas with pollen sources while wasps and ants require hunting areas, often for specific prey species which are needed as food resources for their larvae. Suitable hunting areas are found in a range of habitats from grasslands, scrub and woodlands. Some wasps, ants and bees are cleptoparasites, parasitoids or social parasites on other, often specific, wasps, ants and bees. All species need nectar as a food source, so again there is a need for flower-rich areas (Archer, *op.cit.*).

There are lots of opportunities in York to provide these necessary resources. For example, at the flagship buzzing site at York's Millennium Bridge we are increasing the diversity of wild flowers for nectar sources and have planted Bird's-foot-trefoil *Lotus corniculatus* alongside Mayweed *Tripleurospermum inodorum*, Oxeye Daisy *Leucanthemum vulgare*, Ragwort *Senecio jacobaea*, Yarrow *Achillea millefolium* and Common Fleabane *Pulicaria dysenterica* (see back cover). Spring bulbs have been planted in the York Museum Gardens to help boost that often lacking early spring supply of nectar whereas at Rawcliffe Meadows we are putting in a bee bank to provide vital nesting areas for some of York's unique solitary bee assemblages.

We need your help to do this

Donating to this project will ensure that opportunities to create high quality pollinator-friendly habitat in York are maximised. Just £50 could buy and install a bee hotel; £75 could buy and plant an edible hedge; £250 could fund an entire buzzing site and £1,000 fund an entire flagship buzzing site.

As a thank you for donating we have a range of incentives for you, including free Buglife membership, personalised planting area within one of the buzzing hotspots and a day out with an expert entomologist.

To join us in our work to protect our precious pollinators please donate to our appeal at www.buglife.org.uk/donate-york or phone Buglife's head office on 01733 201210.

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The formation and early years of organized natural history in Hebden Bridge, Yorkshire, and the influence of William Nowell (1880 -1968)

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Introduction

The area in and around Hebden Bridge, including Heptonstall, Todmorden and Mytholmroyd, is well known for many things but to historians of natural history it is the home ground of several notable amateur botanists. Among these are James Needham (1849-1913) (note 1), John Nowell (1802-1867) (note 2), Abraham Stansfield (1812 -1880) and William Mitchell Sutcliffe (1816-1885). These naturalists made Hebden Bridge and the surrounding area famous botanically, especially for the mosses and fungi (notes 1 and 2 and Blockeel, 1981). The area's history has been described by Jennings (1992) and his co-workers from the Hebden Bridge WEA Local History Group. Important collections made by some of these naturalists are held at Leeds (Norris, 1997) following the closure of the Natural History Department of Calderdale Museum Service in 1990 (note 1).

The present article is about the development of organized natural history in Hebden Bridge in the form of a society and the pivotal figure of a local amateur naturalist William Nowell, who later became a professional expert on tropical fungi and rose to high office in the colonial service.

The formation and early years of the Natural History Section at Hebden Bridge

William Nowell was at the forefront in the formation of both the Hebden Bridge Literary and Scientific Society (HBLSS) and the natural history section and is regarded as the main founder of both, serving as President of the section and Secretary of the main society from 1905 to 1909.

Natural history therefore arose from the main society, the latter being founded in December 1905. On 9 March 1906, and at the suggestion of William Nowell, a meeting was convened "to consider the advisability of forming" a natural history section and it was unanimously agreed to establish this. William Nowell gave a short presentation on the aims and where there was "much work to be done especially from an Ecological point of view" (HBLSS first minute book April 27 1907.). This is interesting in that it indicates the direction in which at least his botanical studies would be pursued. Nowell was appointed President, Morton E. Wager, Secretary and Recorders were allocated as follows – J.H. Greenwood (geology), F. Greenwood then W. Greaves (ornithology), E.B. Gibson (entomology), J. Needham (fungi and hepatics) and Nowell (general botany). Field studies ("rambles") and adult biological education were to be key features. Amongst the 38 signatories of intent to join were members of a number of well-known local families as well as some notable regional naturalists.

At the first AGM on 13 October 1906 the naturalists agreed to hold monthly meetings on a Saturday evening and a list of names of potential speakers for the forthcoming session was considered – J.H. Greenwood, W.B. Crump (note 3), W. Nowell, F. Greenwood, A. Newell, E. Halliday and E.B. Gibson. However, numbers attending the subsequent talks were small (27 October 1906 thirteen; 24 November 1906 eight; 22 December 1906 eleven; 19 December 1908 sixteen) but occasionally better – there were forty two at Crump's lecture on 25 January 1907 when he spoke about *Methods of studying plant distribution*. The talks included a variety of topics, *Formation of local rocks* (JHG), *Twelve months with the birds of the locality* (FG), *Suggestions for local work in entomology* (EBG), *Ice age in the head of the Calder Valley* (AN) (all reported in the minutes). It was the intention from the start to emphasise local topics, and when a talk was offered on mimicry, using exotic Lepidoptera as examples, it was turned down. By 1909 there were 50 members and the finances were healthy.

The protection of wild animals, especially birds, was gaining momentum nationally and led to the formation of the Society for the Protection of Birds (from 1904 a Royal Charter added 'Royal') and the Wild Bird Protection Act had been introduced by the government in 1902. The YNU Protection of Birds Committee was established in 1891 and in 1906 changed the name to the Wild Birds and Eggs Protection Act Committee. This was a 'hot' topic at the time and the Annual Report of the YNU for 1905 appealed for all ornithologists and local authorities to do everything possible to ensure the implementation of the Wild Birds Protection Act. Soon after this, and more than likely stimulated by these developments, a meeting was held in Hebden Bridge in March 1907 at which a suggestion was made, again by Nowell, to form a committee "to secure the better protection of local Wild Birds and their eggs by the more rigid enforcement of the clauses of the Wild Birds Protection Act" (first minute book 23 March 1907). Nowell would chair the committee which would include familiar names - Walter Greaves, Samuel Fielding and members of the Greenwood family. Greaves was the ornithologist in Hebden Bridge and a list of the birds of Todmorden by him was added to the *Flora of Todmorden* (Stansfield, Nowell and Greaves, 1911). He also produced a local list of vertebrates (Greaves, 1910).

Visits of the YNU to Hebden Bridge in 1904 and 1929

When the YNU held its meeting in Hebden Bridge in 1904 the members visited the 'Hebden and Crimsworth Valleys' for natural history investigations. This was a year before the formation of the HBLSS and two years before the establishment of a Natural History Section in that society. The YNU visited again in 1915 and in 1929 returned at the invitation of the HBLSS, which by then was well established, and YNU members came as guests for its 68th Annual Meeting and winter conversazione (see Figure 1 p143).

William Nowell

The Oxford University Extension Movement first came to Hebden Bridge in the 1880s and residents seized on the opportunity to further their education by attending lectures in the town and Summer Schools held at Oxford and Cambridge. William Nowell was one of these. He went to Oxford in 1899 (28 July to 28 August, residing in Ruskin Hall) and in 1901 (2 to 27 August, residing at 18 St Johns Street, an Oxford lodging house) – [Oxford reference CE 3/37/13, 15 – pers. comm. from Alice Millea, Oxford University Archives 14 January 2016]. The opportunities offered by the Oxford delegacy meant that "for a small number of men and

women from the working classes of Hebden Bridge the opportunity to participate in the intellectual life of Oxford was to be literally life-changing" (Bibby, 2015). Nowell was interested in plant ecology, words he used before their more general use in biology. In 1907 he gave a talk to the Natural History Section on *"The examination of flowering plants"* in which he outlined why certain plants prefer certain localities and their limits and preferences with regard to soil, drainage and the amount of water available, winds, light and altitude, emphasizing that more research was needed to answer these questions scientifically. He was clearly up-to-date, more than a collector and recorder of species, and ahead of his time in many respects. Other talks by him were on *Vegetation in winter* and *Making a botanical survey and maps*. In the first of these he said that "field work should not be looked upon as exhausted when the student had acquired a knowledge of the name and characteristics of the plants in the locality… [but was] … a stepping stone to broader fields of research" (first minute book April 27 1907) and in his talk on botanical surveys he demonstrated his knowledge of the current developments in botanical mapping.

Figure 2. William Nowell (second from left) with other local naturalists. Pennine Heritage number HLSO5127 and reproduced courtesy of PHDA – Hebden Bridge Local History Society.

The first organised study of British vegetation was by "The Central Committee for the survey and study of British Vegetation", which became known for its "activities in connection with vegetation mapping or vegetation surveys" (Fischedick, 2000). The Committee was established in Leeds in 1904 and included William G. Smith (note 4) and Thomas W. Woodhead (note 5 and Woodhead, 1923) and led, a few years later, to the formation of the British Ecological Society and the *Journal of Ecology* (Fischedick, *ibid*.). Smith came to Leeds in 1897 as Assistant Lecturer in Botany at The Yorkshire College and stayed for 11 years and, with his brother Robert, had done pioneering work in Scotland. Woodhead taught biology at Huddersfield Technical College. Living fairly near to both Huddersfield and Leeds, it is quite possible that Nowell had heard about these recent developments in plant ecology, had attended at least one lecture or had become aware of these developments through the Oxford Movement. He also knew Crump and Crossland, notable Halifax naturalists (note 3), who may have influenced him in the direction he took.

At Hebden Bridge Nowell's interests within the field of botany shifted somewhat over time, from flowering plants to mycology, and he appears to have gradually taken over the responsibilities for the fungi, perhaps out of necessity, from James Needham, who by then was reaching old age. Although Needham's name remained in the list of Recorders, Nowell's name was added as the Recorder for the mosses, fungi and hepatics in 1909.

The meeting of the Natural History Section in Hebden Bridge on October 2 1909 was to be Nowell's last. He was presented with "a suitably inscribed book and a purse of gold" (first minute book October 2 1909) for his work as President of the Natural History Section and Secretary of the main Society and he recorded that his greatest regret leaving the town "was his severance with the Natural History Section" (Anon, 1909). At the following meeting the new President J.H. Greenwood took the chair and, although the membership list for 1909 -1910 includes the names of William Nowell and his wife, it records their address as living in London. Nowell had left Hebden Bridge in order to train for a career in mycology in the colonial service.

Several letters unearthed at the West Yorkshire Archive Service, Halifax (bundle of letters WYC: 1830/7/1 1895-1908 and WYC: 1830/7/2 - botanical correspondence) throw further light on Nowell's early work in botany, his training in London and his links with other naturalists. In a letter from Needham to J.B. Crump, Nov 17 1897, enclosing specimens, he refers to Nowell as "the young man who found it and brought it to me today", adding "I shall be extremely obliged if you will send both specimens back has [as] the young man is only just starting Botanical life". It is clear this refers to Nowell as the same letter enclosed a note from Nowell about his finds, Marsh Helleborine *Epipactis palustris* or Broad-leaved Helleborine *E. latifolia* and Wild Thyme *Thymus serpyllum* and indicates that Nowell began his botanical work in his mid teenage years and at that stage was interested mainly in flowering plants.

Ten years later Nowell's reputation in botany was becoming established and Crump asked Nowell for help with his botanical work. Nowell replied saying that he and his friend "shall both be delighted to assist you...if you will let us serve our apprenticeship under your direction we wish for nothing better" (Nowell to Crump 8 February 1906). Crump provided his considerable knowledge and later testimonials for Nowell (letter of thanks, Nowell to Crump 25 June 1907 and request for another 16 May 1911). By now Needham was giving lectures to the Halifax Scientific Society (on *Studies in roots* 11 July 1906; *Vegetation in winter* 26 February 1908 and *The life history of the Sycamore* 9 June 1909 and leading excursions of the Halifax Scientific Society (1 May 1909) to Hardcastle Crags.

Describing his training in London, Needham writes (Needham to Crump, 14 October 1909) "I am taking the advanced Botany course under Professor Farmer, really the course for final Hons. London BSc...they tell us practically nothing but chivvy us back if results are wrong". In another letter (Nowell to Crump February 14, 1911) he is immersed in the fungi and thinking about his future, "I have touched nothing but fungi since coming back. A Mycological post, probably abroad, is likely to be my fate".

Discussion

This comparatively late (compared to other societies), modest and brief excursion by the HBLSS into natural history did not last long. Although Natural History was the oldest Section, by the 1950s numbers had dropped further (membership was 19 in 1956-57 and later down to 14, then 9) as the main Society gradually began to be dominated by studies in local and family history and the Natural History Section disappeared at the end of the 1950s (August 1959 was the date the Natural History Section officially wound up, HBLSS Membership List

General Society and Sections 1956 to 1966 – information provided by Diana Monahan). However, some important Yorkshire naturalists were associated with it and it was important for some of its more active members, none more so than William Nowell, in that it formed a stepping stone towards his rank among the professional biologists.

When Nowell was training in London he became a friend of Professor J. Bretland Farmer FRS, Professor of Botany at the Royal College (Imperial College) of Science. Farmer wrote a foreword to Nowell's account of the *Diseases of crop-plants in the Lesser Antilles* (Nowell, 1923). Farmer said that Nowell had "an established reputation…based on brilliant elucidations of various difficult problems in plant pathology…[and his work]…is a real landmark of progress". His scientific potential had now been realized, he was an acknowledged expert on fungi and later became an excellent colonial administrator. Clearly his time in Hebden Bridge was fast moving and he had learnt much from other experienced naturalists like James Needham. This would prepare him well for his future career as a professional mycologist and administrator.

Acknowledgements

The author would like to thank Steve Gill, Albert Henderson, Rebecca Machin, Diana Monahan, Secretary of the Hebden Bridge Local History Society, Frank Woolrych of Pennine Heritage, HBLHS, Halifax Scientific Society and West Yorkshire Archive Service, Calderdale, for their generous help.

Notes

The HBLSS archive is held at the Birchcliffe Centre in Hebden Bridge and includes the minute books of the main Society and those of the Natural History Section. For the latter there are three books dated 1906-1911, 1911-1920 and 1952-1957 [see Natural History Catalogue NHS 1-26 and General Society Catalogue A101- 182, B 1-53, C1-58, D201-253, F21- 77]. There are many other items of general biological interest as well as local and family history. See via website www.hebdenbridgehistory.org.uk/archive

Note 1. James Needham was born in Hebden Bridge and interred at the Birchcliffe Baptist Chapel. He was awarded Honorary Life Membership by the HBLSS in 1907 for his work in mycology. For further details on Needham and his collections see Crossland (1913), Henderson (1992) and Mark Lawley (http://britishbryologicalsociety.org.uk/). The collections at the Leeds Discovery Centre include over 800 sheets (James Needham) and 519 packets (William Sutcliffe) of predominantly moss material (Rebecca Machin, Leeds, to author 13 April 2016).

Note 2. Much has been written about the artisan naturalists from this area of Yorkshire and from Lancashire. John Nowell (1802-1867) is the "most celebrated of the working-men bryologists" (Blockeel, 1980) - see also Foster, 1980.

Note 3. William Bunting Crump (1868-1950) was a schoolmaster in Halifax, an antiquarian and joint author, with Charles Crossland, of *The flora of the parish of Halifax* (Crump and Crossland (1904). Crossland was Secretary of the Yorkshire Mycological Committee (Massee and Crossland, 1905).

Note 4. William Gardner Smith (1866-1928) born in Dundee, studied there under Professors D'Arcy Thompson and P. Geddes. Member of the YNU and a pioneer in vegetation surveys - see Woodhead (1929).

Note 5. Thomas William Woodhead (1863-1940) born in Holmfirth. Joint editor of *The Naturalist* (1903 to 1932), President YNU (1922). Acquired interests in natural history from rambles and classes at the Mechanics Institute and from fellow naturalists like Crossland. Started teaching evening classes and later became Head of Biology at Huddersfield Technical College. Another pioneer in vegetation surveys and ecology - see Pearsall (1940).

Note 6. A diary charting his experiences was found in a second-hand bookshop in Hastings and is now held at the archives in Hebden Bridge (SPC 10/S).

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Figure 1. *Top:* Circular for the YNU's 68th Annual Meeting at Hebden Bridge on 7 December 1929, by invitation of the Hebden Bridge Literary and Philosophical Society. HBLHS archives at NHS/25. *Lower:* Circular for the YNU 179th meeting [Excursion] at Hebden Bridge on 11 June 1904 for "Investigations of Hebden and Crimswoth Valleys". Hebden Bridge Local History Society (HBLHS) archives at NHS/24.
Both with permission from the Hebden Bridge Local History Society.

CIRCULAR 179th.

Yorkshire Naturalists' Union.

President: A. H. PAWSON, J.P., F.L.S. Farnley.
Hon. Secretary: T. SHEPPARD, F.G.S., Municipal Museum, Hull
Local Secretary for this Meeting:
T. W. WOODHEAD, F.L.S., Technical College, Huddersfield.

THE 179TH MEETING

WILL BE HELD AT

HEBDEN BRIDGE,

FOR THE INVESTIGATION OF THE

HEBDEN AND CRIMSWORTH VALLEYS,

ON

Saturday, June 11th, 1904.

RAILWAY ARRANGEMENTS.—Through return tickets at pleasure party rates will be issued at all stations on the G.C., G.N., H. & B., L. & Y., L. & N.W., Midland, and N.E. Railways which have booking arrangements for Hebden Bridge to Members and Associates of the Y.N.U. surrendering the Certificate noted below. Tickets taken on Friday, June 10th, will be available for return on Monday, June 13th. Where through bookings are not in operation Members may book to most convenient junction, and re-book to destination; the reduced fares being available for each stage of the journey.

N.B.—The Railway Booking Clerks will only grant these reduced fares to Members and Associates producing a Special Certificate signed by the Secretary of the Union. Members and Associates wishing for this Certificate must apply to Mr. Sheppard for it, and must enclose a stamped directed envelope and their current card of membership of the Union, which latter will be returned with the Certificate. At stations on the N.E. Rly. tickets at the reduced fares will be issued on production of the signed card of membership.

BOOKS AND MAPS.—The whole area is included in Sheet 88 N.W. of the Original One-Inch Ordnance Survey. This may also be had geologically coloured. In the New Survey it is mostly included in Sheet 77. The "Botanical Map of Leeds and Halifax District," by Smith & Moss, shows the distribution of the vegetation and is accompanied by explanatory text. "The Flora of the Parish of Halifax," by Crump & Crossland, includes the Hebden Bridge district, and gives a very complete account of both phanerogams and cryptogams. Davis & Lee's "West Yorkshire," and the Geological Survey Memoir should be consulted: also Spencer in "Proc. Yorks. Geol. and Polyt. Soc.," vol. 13, pp. 391—394: and Wheelton Hind, "Q. J. G. S.," vol. 57, pp. 373—374.

THE DISTRICT. Five miles west of Hebden Bridge the axis of the Pennine anticlinal forms the boundary of Yorkshire and Lancashire. From this escarpment (Black Hameldon 1574 ft., Jackson's Ridge 1573 ft.) the plateau gradually falling to the east, in accordance with the strata, is entirely composed of the lowest member of the Millstone Grit—the Kinderscout. Most of its surface is

CIRCULAR No. 352.

Yorkshire Naturalists' Union.

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Prof. A. C. SEWARD, M.A., F.R.S., Cambridge.
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The 352nd Excursion

AND

68th Annual Meeting

WILL BE HELD AT

HEBDEN BRIDGE

BY INVITATION OF THE

Hebden Bridge Literary and Scientific Society

ON

Saturday, December 7th, 1929.

Appendix 1. Timeline for William Nowell

1880 Born 9 May at Heptonstall,Yorkshire.
1880 Baptised 5 September at St Thomas's Church, Heptonstall.
1891 Census – aged 10, a Scholar.
1899 Attended Oxford University Summer School in Oxford.
1900 Ambulance volunteer, Boer War, South Africa (note 6).
1901 Census - Fustian Cloth Brusher, Hebden Bridge.
1901 Attended Oxford University Summer School in Oxford.
190? Elementary School teacher at Stubbings School, Hebden Bridge.
1905 Co-founder of the Hebden Bridge Literary and Scientific Society.
1906 Founder of the Natural History Section of the HBLSS.
1906 Married Jemima (Jeannie) Rushworth from Halifax.
1909 Leaves for London to train at the Royal College of Science (Imperial College).
1911 Completes Diploma course at Imperial College specializing in botany.
1911 Assistant Superintendent, Department of Agriculture, Barbados, West Indies.
1913 Mycologist/ lecturer, Imperial Department of Agriculture, West Indies.
1920 Assistant Director of Agriculture, Trinidad and Tobago.
1924? Director of Science and Agriculture, British Guiana.
1926 Director of the Agricultural Research Station, Amani, Tanganyika, East Africa.
1929 Awarded CBE.
1936 Retired from the Colonial Service and returned to England. CMG.
1938 Chairman, West African Cocoa Commission.
1968 Died 1 October at Horsham, Sussex, England.

John Frank Raw, naturalist, and his significance today

Anthony Raw, Departamento de Ciências Biológicas, Universidade Estadual de Santa Cruz, Ilhéus, Bahia, Brazil
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My father, John Frank Raw, was a competent, self-taught naturalist and gardener. His interest in natural history began very early. By the age of nine he had reference collections of common birds' eggs and butterflies. He was born in 1904 in Stockton-on-Tees, in 1916 the family moved to Middlesbrough and in August 1918 to Linthorpe (54°33'N; 1°15'W). That move was wonderful and it was his home for the rest of his life - another 72 years. The large garden and surrounding fields were full of wildlife. At that time there were a dozen houses close by, a few further away and the nearest village was Linthorpe half a mile

to the east. The Eston Hills, outliers of the Cleveland Hills, were clearly visible from home. The whole area is now built up.

From 11 to 15, he spent every summer at Finkle House in Fryup Dale by the River Esk. Raws have been farming in that area since 1628 and still do. He spent all his time looking for Red Grouse *Lagopus lagopus*, Curlew *Numenius arquata* and Golden Plover *Pluvialis apricaria* on the moors and everything else in the hedgerows. He wrote "At that time I stayed in the country every summer when I had my holidays from school with a paternal aunt, a simple soul, now dead alas. I am afraid I shocked her terribly at times, and caused her a great deal of worry as I was always getting my feet wet, tearing my clothes climbing trees etc; most of these mishaps occurring while in quest of eggs, of course. My predilections in that direction were well known throughout the district, and many a good specimen came my way owing to this, a couple of corncrakes' from a farmer here, a magpie's from the chain of a farm lad there, and so many of these good folk have died, or left the district, and I haven't been to my old haunts for a few years now, so we hope the birds are getting a bit of peace."

By age 15 he had taught himself to draw and paint animals and plants (Figure 1). In 1918 he was given a copy of *Nature-lover's Handbook* by Richard Kearton and other authors. It contains information on the seasonal activities of birds, butterflies, moths, ground plants and trees. Through this and other volumes he discovered how the appearance of species varies throughout the year and from year to year. These subjects would occupy much of his time for the next two decades.

Many birds nested in the hedgerows around his home. He found innumerable nests of Chaffinch *Fringilla coelebs*, Greenfinch *Carduelis chloris*, Linnet *Linaria cannabina*, Blackbird *Turdus merula*, Song Thrush *T. philomelos* and Dunnock *Prunella modularis*. There were also many nests of Willow Warbler *Phylloscopus trochilus*, Mistle Thrush *T. viscivorus*, Robin *Erithacus rubecula* and Wren *Troglodytes troglodytes*. Once (19 June 1927) he found a Hawfinch *Coccothraustes coccothraustes* nest. Meadow Pipit *Anthus pratensis*, Skylark *Alauda arvensis*, Grey Partridge *Perdix perdix*, Rabbit *Oryctolagus cuniculus*, Wood Mouse *Apodemus sylvaticus* and shrews were abundant in the surrounding fields. Snipe *Gallinago gallinago*, Frog *Rana temporaria* and Toad *Bufo bufo* and both Smooth *Lissotriton vulgaris* and Great Crested Newt *Triturus cristatus* were common in and around the ponds. Kestrel *Falco tinnunculus* hovered over the fields by day and Barn Owl *Tyto alba* hunted by night. He saw so many nests that he knew to within a day the ages of the nestlings of all the common birds.

The diary

He kept a diary for eleven years (from 1928 to 1938) and wrote more than 1,000 pages on local natural history, the weather and events in the garden. He walked and cycled around all of Cleveland. In 1939 he married and started work at the North Riding Infirmary in Middlesbrough and had little time to continue his diary.

Figure 1. A page from the diary of J.F.Raw, showing painted illustrations of an Eyed Hawk-moth caterpillar *Smerinthus ocellata* and a Red Admiral butterfly *Vanessa atalanta* from August 1920.

Native moths

He recorded well over 100 species of moths around Teesside and Cleveland at flowers and also by sugaring. Every year he reared up to a dozen species of caterpillars not knowing what adults would emerge. For example, one he collected from oaks at Ingleby Arncliffe (12 miles south of Linthorpe) emerged in August 1933 and proved to be a Merveille du Jour *Griposia aprilina*.

When the normal food plant was not available near home he found substitutes. He reared hundreds of caterpillars of two moorland species, the Oak Eggar *Lasiocampa quercus* and Fox Moth *Macrothylacia rubi* which he supplied to a butterfly farm at Burniston just north of Scarborough. It opened in 1884 and was the first in the world. He returned many pupae to the moors; the larvae eat Heather *Calluna vulgaris* which did not grow around Linthorpe, but he found they grew well on Hawthorn *Crataegus monogyna*.

The moors

Cuckoos *Cuculus canorus* were common, especially on the moors. On arriving from their migration he knew they went straight to the moors. For example, in 1933 he noticed there were no Cuckoos on Eston Hills on 15 May but by 18 May they were "everywhere". They eat the caterpillars of Fox Moth and Oak Eggar which bear irritant hairs. No other birds will touch them, but the Cuckoos consume them avidly. He knew the Oak Eggar is biennial and the larvae are especially common in alternate years. The Cuckoos were especially common every second year.

Colour variations in Lepidoptera

With the butterflies and moths he noticed individuals with slightly different colouration. For example, Meadow Brown *Maniola jurtina* butterflies near Stokesley were much paler than those at Eston, suggesting that they were separate populations just seven miles apart. In his back garden some Magpie Moths *Abraxas grossulariata* bore a continuous black bar across the forewing while others bore the more or less separate spots typical of the species.

When he moved to Cliff Cottages in Linthorpe (1918) all the Peppered Moths *Biston betularia* in the neighbourhood were 'peppered' and camouflaged when they rested on the lichen-covered trees. The first dark form he reported was caught by a friend in Linthorpe on 14 July 1927. By 1937 all the moths around the village were the dark form which he called *doubledayi*. The smoke from domestic coal fires left a deposit of soot on the trees, killing the lichens, and the blackish moths were better camouflaged. However, he found that the peppered form was still common in the woodland on Eston Hills in 1937.

Selected observations

- About 6:30 a.m. on 29 June 1927 a total eclipse passed over northern England, the first for 203 years. It was cloudy and had little effect on the behaviour of the birds.
- The weather during the spring and early summer of 1927 was very fine, which enabled a pair of Dunnock to raise a second brood; they fledged on 14 July, the only time he saw this bird raising two broods in a season.
- One day he heard "the peculiar whirring call of the partridge". Somewhat surprised, he traced it to Starlings *Sturnes vulgaris* in an adjacent tree. He knew that they imitate the calls of other birds but was still impressed at their accuracy. Another was "giving a very passable imitation of a skylark". A few years later he heard one singing like a Willow Warbler *Phylloscopus trochilus* and pointed out that one must take care to see the songster when recording the presence of migrant birds. This was important to him as he recorded the first appearances of birds each year for the Phenological Society.

Phenological Society

In 1933 father became an official recorder for the Phenological Society of London and provided them with data until 1938. With very few recorders in north-eastern England, his contribution was valued. He recorded the first appearances of 50 species of moths each year. The moth list had been compiled by the South-Eastern Union of Scientific Societies and included various moths not found in father's area. Major H.C. Gunton MBE, FRES asked father to suggest substitutes. Father proposed 17 moths which were quite common in the north and appeared about the same time of year as the originals. The new list was sent to two other recorders: Mr C.W.V. Gane, a teacher from Bridlington and Dr Lowther of Grange-over-Sands, Lancashire, for their approval.

The abundance of species

He wrote that several species were very common. Here are a few examples.

- In July 1927 he wrote of the males of the Ghost Moth *Hepialus humuli* which swarmed in such large numbers in front of the house he could collect dozens in a few minutes. On several evenings he saw a Pied Wagtail *Motacilla alba yarrellii* catching them in flight "almost in the manner of a flycatcher".
- In 1928 he commented that the 'Osier Clearwing' moth [this is Lunar Hornet Moth *Sesia bembeciformis* -Ed.] was said to be rare but, he wrote, it "is certainly common with us".
- At Ingleby Arncliffe he saw thousands of Primroses *Primula verum* and many violets in flower and was surrounded by lots of Cuckoos calling all around.
- On 1 June 1930 he visited South Gare (the long breakwater on the south side of the mouth of the River Tees) where Skylarks *Alauda arvensis* were singing and "there appeared to be hundreds of them about the sand banks".
- In July 1927 he saw a single Heart and Dart moth *Agrotis exclamationis*, the first since 1922 when they were common. In the 1950s father and I found that this moth was still present but not common.

Rarities

Some species occasionally appeared in the neighbourhood.

- The Hummingbird Hawk-moth *Macroglossum stellatarum* is a migrant from southern Europe. He saw the first for many years at honeysuckle on 12 September 1933.
- The same year he found a Death's-head Hawk-moth *Acherontia atropos* at Stokesley.
- The first Golden Plusia moth *Polychrysia moneta* he collected was in August 1928. He took four others in 1932 and 1933. He knew the most northerly locality recorded for this moth was the village of Hart in County Durham, just nine miles north of Linthorpe [it is still very scarce in this area - Eds].

Decreases in once common species

Up to the 1930s father recorded many more species of birds and insects in the garden than either of us ever saw in the 1950s and 1960s. He saw species typical of the countryside, many of which have not been seen in the neighbourhood since the town expanded beyond Linthorpe.

- Cuckoos had been abundant but he heard only one after 1926. On 28 April 1936 he heard one in Linthorpe Cemetery and never heard or saw one in the town after that.
- Lesser Whitethroats *Sylvia curruca* had been common up to 1925, but he did not see any near home after that, though they nested for a few more years in the Cemetery.
- He recorded Corncrakes *Crex crex* in the district for two years and then they disappeared. In 1931 he heard three. One near Stokesley on 27 May was the first he had heard since his holidays in Fryup (about 1917). On 11 June he heard one near Acklam Hall just a mile south of Cliff Cottages and on 25 July another near Dunsdale 8 miles due east. In 1932 he heard two; on 21 May at Margrove Park 3 miles south-east of Dunsdale, and on 23 May at Acklam. After that he heard no more.

My father's contribution to science

Father recorded the great abundance of some species and the rarity of others and noted how the populations of some varied from year to year. The populations of innumerable species of plants and animals in Britain were enormous up to a hundred years ago. The dramatic declines of many species began in the 1920s and 1930s. That was the time my father was making his observations. His explanations for these losses have been confirmed by others.

He identified three factors responsible for the losses of animals and plants. First was the increase in building for the enlarging population. The town was expanding rapidly and this created two problems. One was the direct loss of habitat and the other was the activities of the inhabitants. By 1927 swarms of children were over-running the fields and hedges surrounding Cliff Cottages and destroying all the birds' nests they found. They were from the new housing in Linthorpe, half a mile to the east.

A second factor was the growing popularity of the family car which could reach almost everywhere in the country and not simply places around railway stations. In August 1933 he saw Moles *Talpa europaea* and Snipe at the roadside killed by cars. He wrote "more birds are killed every year in this manner, and I have seen scores of dead thrushes and other small birds on the roads this year" (1934). The increased numbers of road-kills might have been related to the removal of the 20 mph speed limit in January 1930.

The third was the introduction of exotic species. On 24 June 1931 he reported seeing a Grey Squirrel *Sciurus carolinensis* in Stewarts Park on the outskirts of town (2½ miles south-east of Cliff Cottages), the first he had seen in the district. On 20 November 1933 he reported seeing a Red Squirrel *Sciurus vulgaris* near Coulby Newham, 1½ miles south of Stewarts Park and wrote "This species is seldom seen, though grey squirrels are fairly common".

Of particular importance are father's records of the great abundance of species that are now facing extinction in Britain. Birds and butterflies are generally used for these surveys because they are the best-known and they are the groups he knew best. Accounts might exist of species abundance in the old archives of other naturalists. They are invaluable records and my hope is that after reading the present article their owners will make them available.

The situation today

Innumerable recent reports on mammals, birds, butterflies and plants compare the numbers in Britain today with those of a few decades ago. All report substantial losses and even local extinctions. While these numbers are largely accurate, in a way they are misleading. Clearly the losses have not been just over the past few decades. Although the records of the sizes of populations a century ago are largely anecdotal, they should be taken into account if we are to fully understand our present predicament. Many species suffered huge drops in numbers from the 1920s to the 1950s. For a realistic ecological assessment, 'once common' should refer to their abundance a century ago and not to losses over the past few decades. Up to now, concern has been on the extinction of the rarer species. However, Dr Rachael Winfree and her colleagues asserted that the real threat to the functioning of an ecosystem is the increasing rarity of once common species (Winfree *et al.,* 2015).

In a telling indictment, the historian J.R.McNeill (2001) wrote that humanity's most important change in the 20th century was not sending someone to the moon, splitting the atom, the rise and fall of communism, the advent of human rights, the feminist movement or either of the World Wars. His message was that history will consider what humans have done to the environment to be the single biggest change of the last century.

Dedication

Without my father's kindly supervision I would never have entered university. Recently I retired, having taught ecology to Brazilians at undergraduate and postgraduate levels for forty years.

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Winfree, R., Fox, J.W., Williams, N.M., Reilly, J.R and Cariveau, D.P. (2015) Abundance of common species, not species richness, drives delivery of a real-world ecosystem service. *Ecology Letters* 18: 626–635.

YNU Membership Survey – results and next steps

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Introduction

During February and March this year we conducted a survey by questionnaire to improve our understanding of what members want from their YNU membership and how we can better support their interests in natural history. We received 151 completed questionnaires: 112 from current individual members, 21 from former members and 18 from affiliated societies. We are delighted with this response and would like to express our sincere thanks to everyone who participated.

The issues and suggestions raised by the survey will be discussed by YNU officers, notably the Executive, Natural Sciences Forum, Education Committee and the Editorial Boards of our publications, to decide how we can act on the survey results to improve services to members. A broad summary of the survey results is presented here. The detailed data behind this summary are available to YNU officers to help them carry out their role in the YNU; for example, section heads could use the information to communicate with members who have an interest in their taxonomic area.

An important and very positive result of the survey was the number of people who said they would consider helping to run the YNU. There are over 90 volunteer roles in the YNU, ranging from being chair or recorder for a species- or habitat-based section to providing a service for the YNU as a whole, such as treasurer, librarian or webmaster. Six of these roles are currently vacant, the rest are shared between 55 members, many of whom have served the YNU for several decades and would like to retire. The YNU is run by and for its members. Everyone has something to contribute, and at the risk of sounding clichéd, you only get out what you put in. The YNU has played a crucial role in developing skills and knowledge in natural history in the region for over 150 years, thanks to active participation by members. Provided that the new generation of YNU members is willing to dedicate their time and enthusiasm as their predecessors did, the YNU could continue for another 150 years and more!

Survey results – summary of key points

Demographics

Of the 133 individual members who responded, 80% were males and 20% females. This is exactly the same as the gender breakdown of the 55 members who currently contribute to running the YNU on a voluntary basis. The majority of respondents were born in the 1940s and 1950s (fig. 1). The proportion of respondents with a professional interest in natural history is highest amongst those born in the 1970s and 80s. The proportion of respondents who have let their membership lapse is highest amongst those born in the 1980s; 50% of respondents in that age bracket have left the YNU. This is clearly a matter of great concern for the future of YNU and we hope to use the survey findings to introduce improvements to increase member retention.

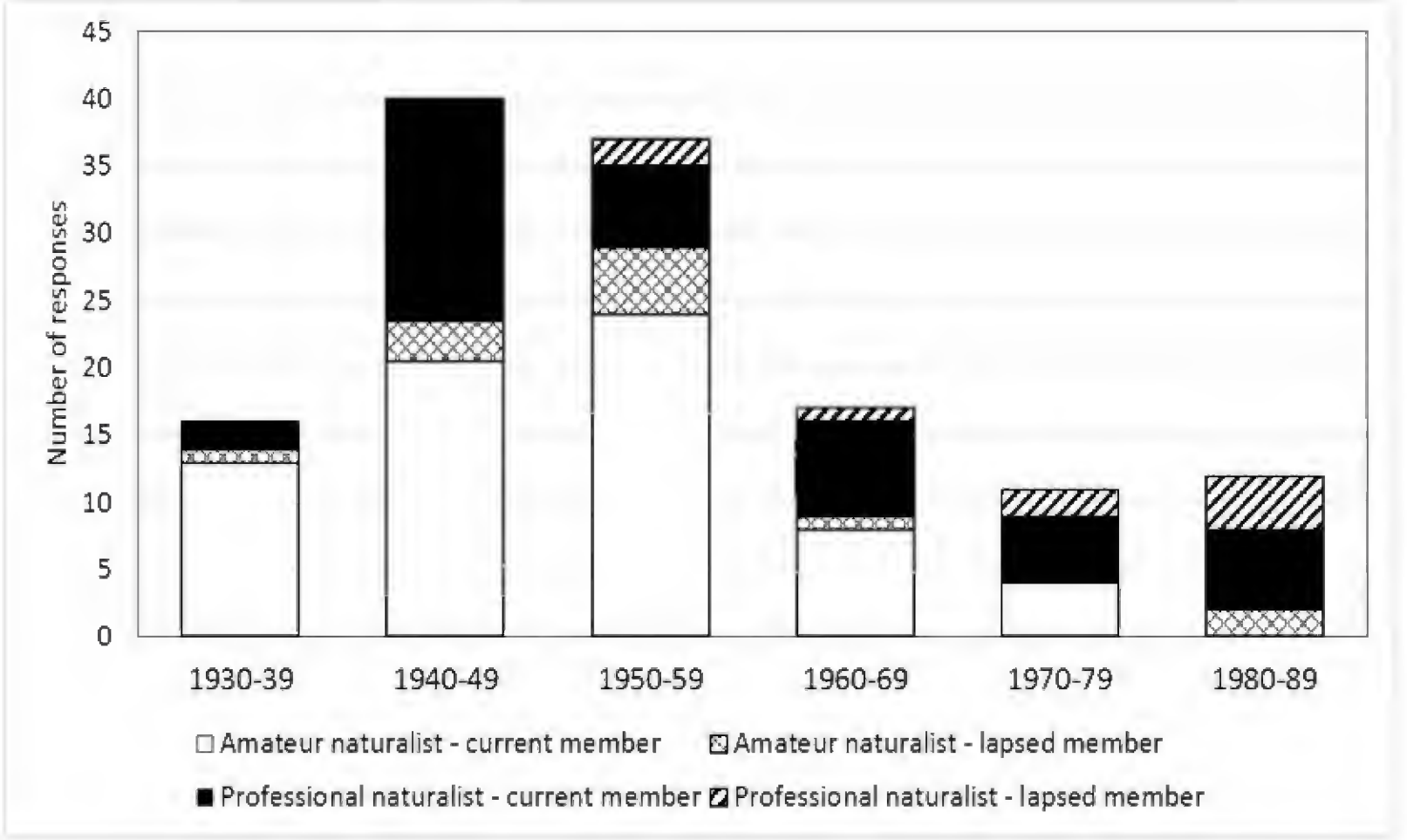

Figure 1: Breakdown of responses by year of birth and amateur/professional interest in natural history (n=133)

Members' interests

The survey results confirmed the great diversity of natural history interests and expertise within the YNU. Unsurprisingly, birds, butterflies, moths and plants featured highly as members' main interests, but it was encouraging to see nature conservation selected as a main interest by 63% of respondents (fig. 2 below). Additional interests mentioned by members included ecology/ecosystems, the social history of natural history, natural history as subject matter in fine art and palaeoecology/fossils.

Natural history skills

72 respondents stated that one of their main reasons for joining the YNU was to learn or improve species identification and recording skills. 31 respondents had attended training courses, of whom 50% rated them "excellent" and 50% "good". Several comments showed that respondents had found YNU training events valuable, for example, "I attended a freshwater biology workshop at Malham… the training was excellent." and "I attended a training event run by John Newbould about 10 years ago and have been working in plant ecology, so this event really helped me. Thanks again John!"

The YNU's main opportunity for supporting natural history skill development is through our programme of field meetings. 48 respondents had attended field meetings of whom 40% rated them "excellent", 52% "good" but 8% only "fair". Some respondents stated that they wanted to improve their skills but felt "out of their depth" at YNU meetings; one had found field meetings to be "cliquey", another commented "I lack experience so feel unable to contribute" while another stated "I always felt [field meetings] were aimed at other people

than me". This is disheartening to hear, but nevertheless useful because it is something we can try to rectify.

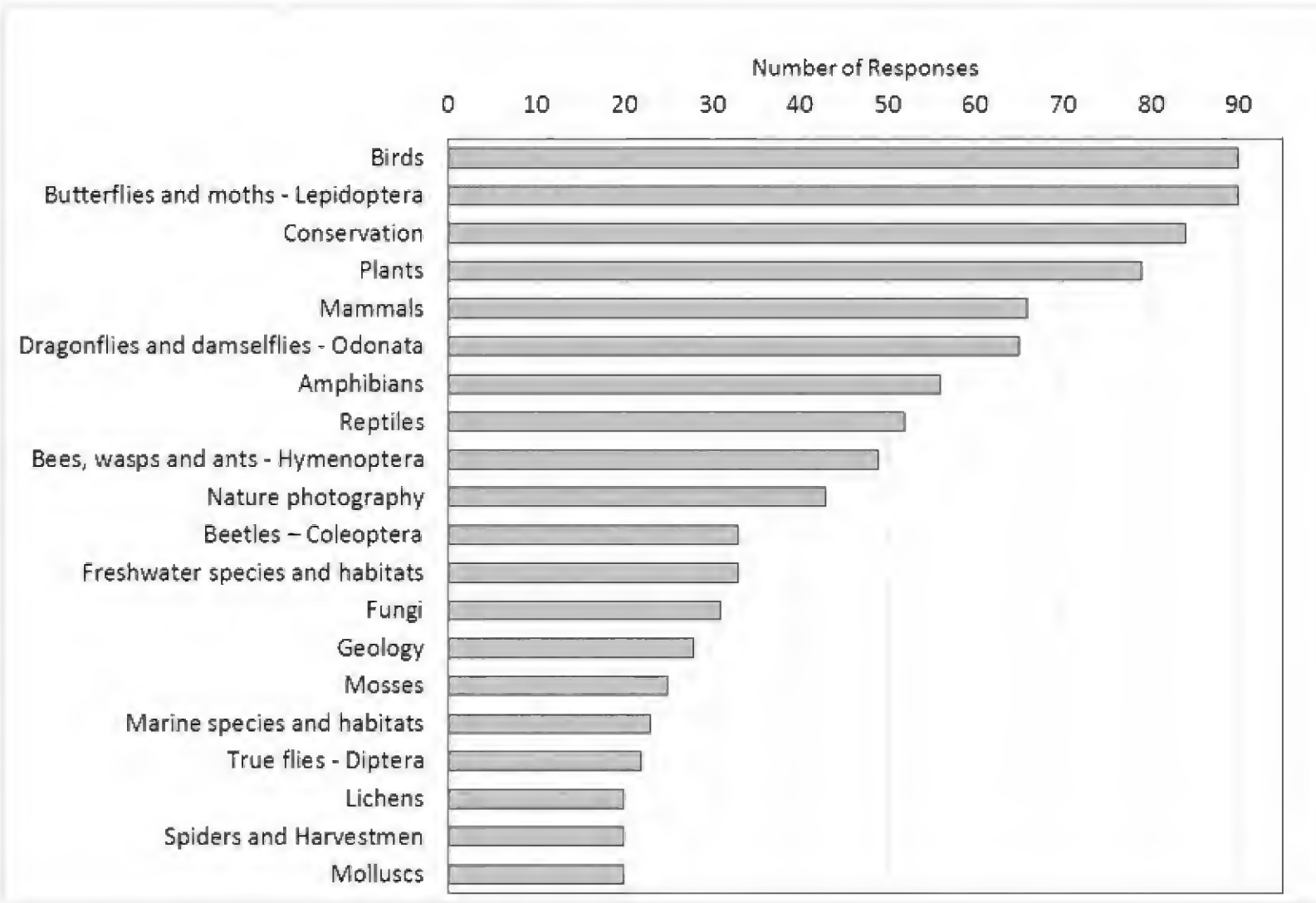

Figure 2: Respondents' main interests in natural history.

57 respondents said that they would like the YNU to run field meetings specifically aimed at beginners or improvers. One member suggested having a small group of people responsible for welcoming and communicating with newcomers at field meetings and other events, while another commented "The idea of training field meetings is really good - YNU wasn't very welcoming to less experienced people 20 years ago. Perhaps they could be a broker for mentoring, i.e. someone getting interested in say beetles could be paired with an experienced member."

It was pointed out that some sections, such as Conchology, already do run field meetings as training events and are very welcoming to beginners, and as one respondent stated "some sections are more active and friendly than others".

Biological Records

The majority (88%) of respondents said that they record wildlife. 93% of those who record wildlife said that they would like their records to be used to inform local decision making. It is often assumed that data sent to national recording schemes, their associated local groups or entered into online recording systems such as iRecord, will be considered in local decision making, but this is not necessarily the case (Pickles and Millington, 2015). YNU members submit their records via various channels, but the most popular route according to the survey

responses is to national recording schemes and societies (fig. 3). Further work is needed to investigate the flow of biological records from the YNU to ensure that information is used to inform local decision making in accordance with members' wishes.

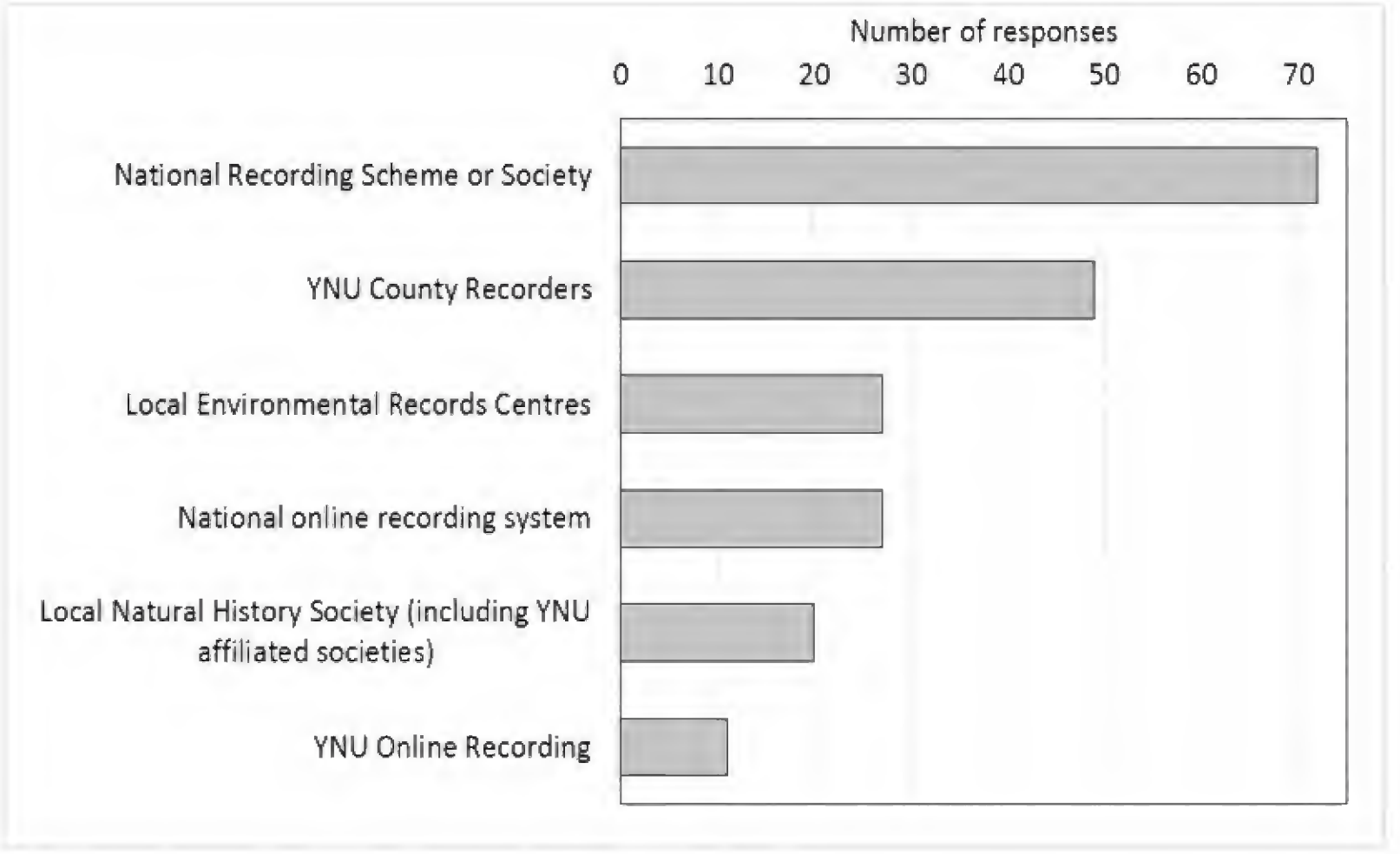

Figure 3: Breakdown of where YNU members submit biological records (respondents could choose more than one option)

Regardless of whether records are submitted to YNU Recorders directly or via the YNU's online recording system, feedback to members is absolutely crucial for maintaining their motivation, as the following comments show: "My records and photographs of species sent in were not acknowledged - disheartening for a beginner!" and "My records that I have put on the YNU website are not reviewed so recording them seems a pointless exercise."

Publications

The majority of current and former members who responded rated YNU publications as excellent or good (fig. 4). Of those who rated *The Naturalist* "fair" or "poor", some felt that it had become "dumbed down", while others in complete contrast said they found it "too academic", "very technical", "dry" and even "quite impenetrable". Respondents acknowledged the challenge of producing a publication to appeal to the diverse interests of the YNU membership, but the general consensus was that *The Naturalist* is achieving this well. As one member pointed out, the generalist nature of *The Naturalist* "is a good thing and can result in you taking an interest in areas that otherwise you would not".

Suggestions for improvements to *The Naturalist* included a "wants and exchange" page for books and equipment, an article about the YNU itself aimed at newer members or those who are not currently actively involved, the inclusion of short casual field notes, invited articles

from affiliated societies, and short introductory articles by YNU Sections to introduce the different disciplines covered by the YNU to the wider membership.

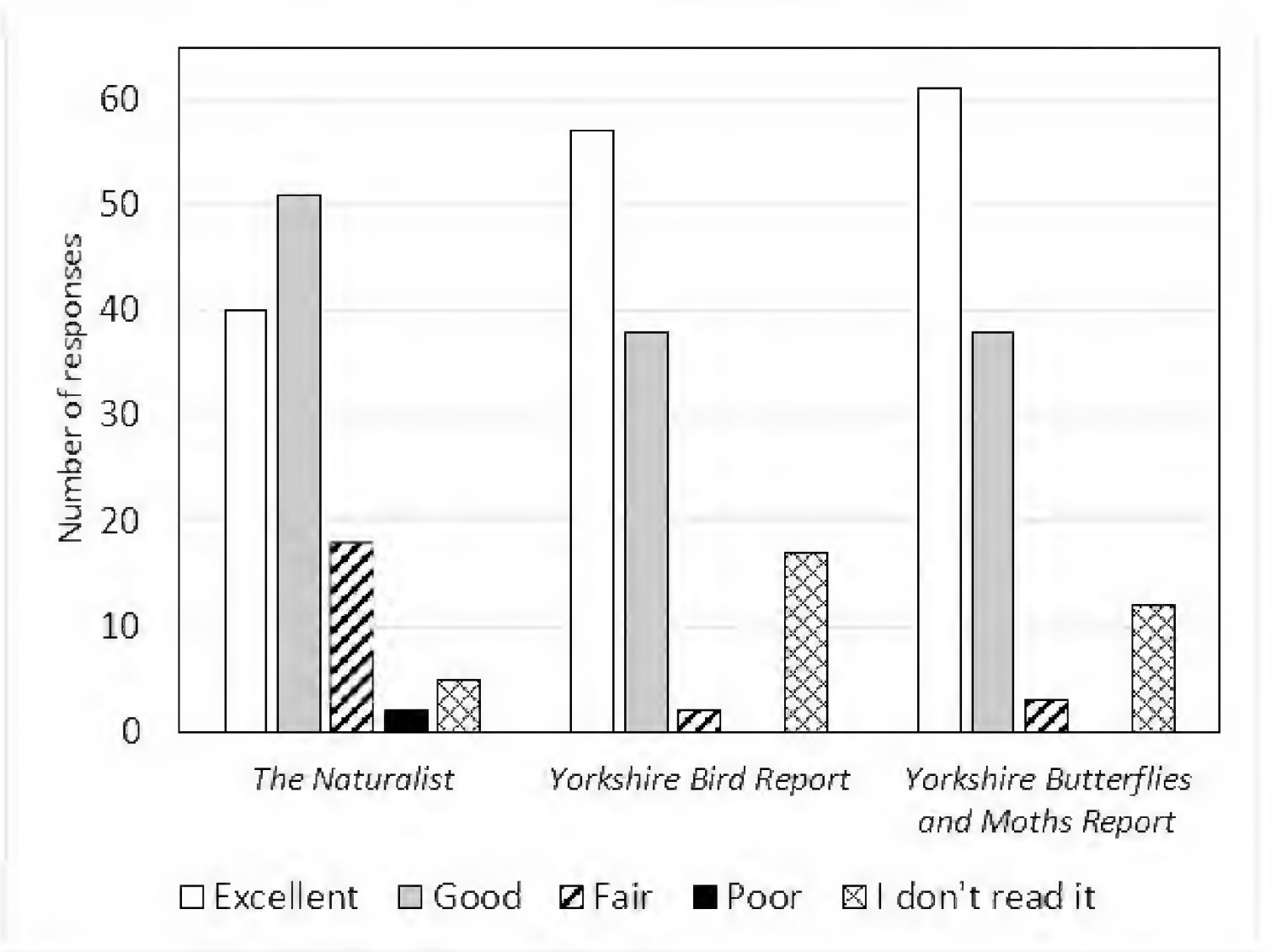

Figure 4: Respondents' rating of YNU publications

One member suggested that the YNU should consider running a "workshop for people who may be interested in writing papers for publication in *The Naturalist* - with talks from people who have had papers published - how did they go about their research, analyse their data, write and submit their paper etc." This is an interesting suggestion and could be worth pursuing if there is enough interest from current and potential authors.

A member commented "Since we no longer publish the *Bulletin*, there is no means of communicating informal YNU news and updates to the membership except via the website and social media". The survey responses suggest that a relatively small proportion of members currently uses the website and social media (fig. 5), although this is expected to increase in future if the YNU is successful in recruiting and retaining a younger generation of members.

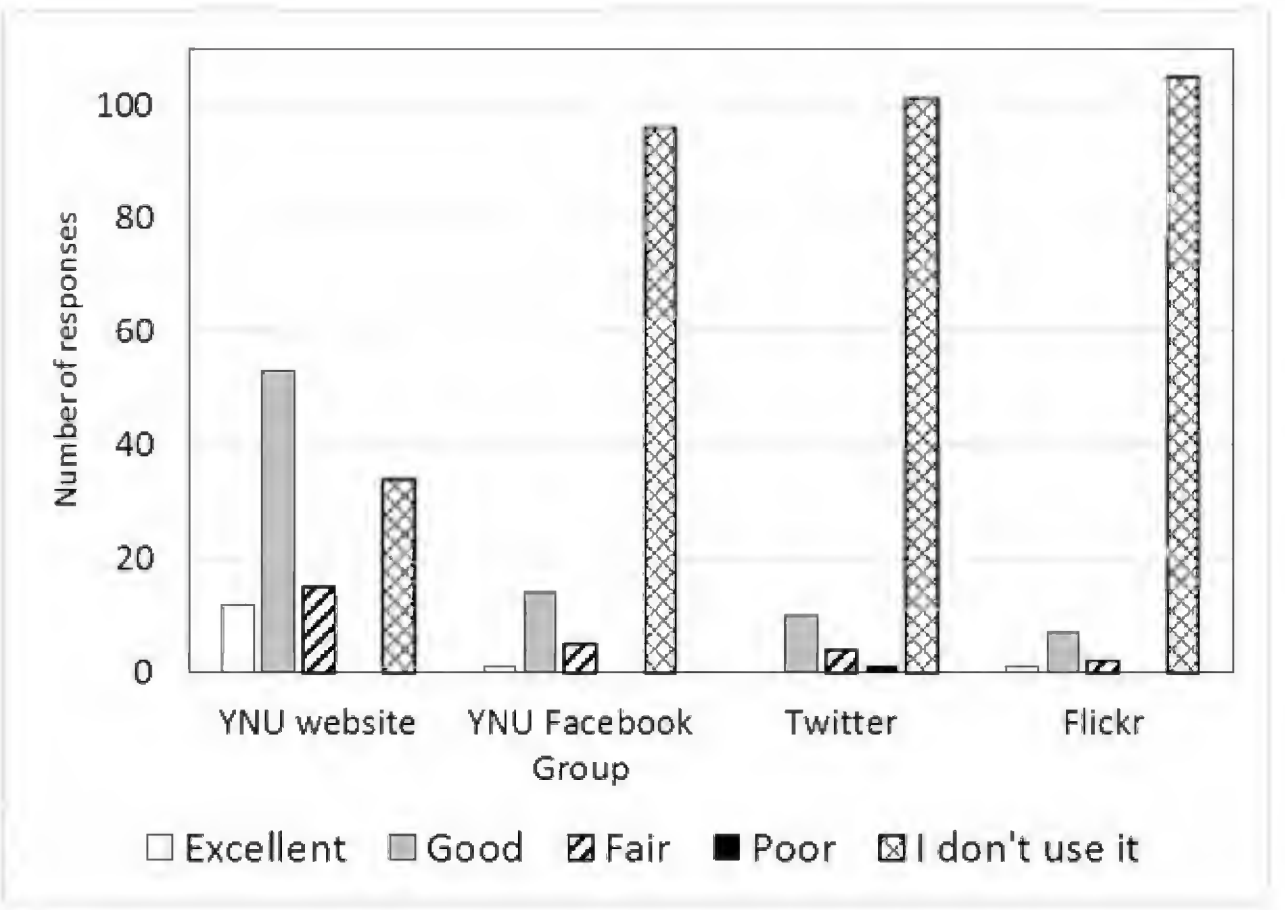

Figure 5: Respondents' rating of the YNU website and social media.

Getting the most out of YNU membership

Despite the largely positive ratings of YNU publications, these do not seem to be a main motivating factor for joining the YNU. The main reasons stated by respondents for joining the YNU were to support the organisation, meet people with shared interests, learn or improve species identification skills and participate in events and activities (fig. 6).

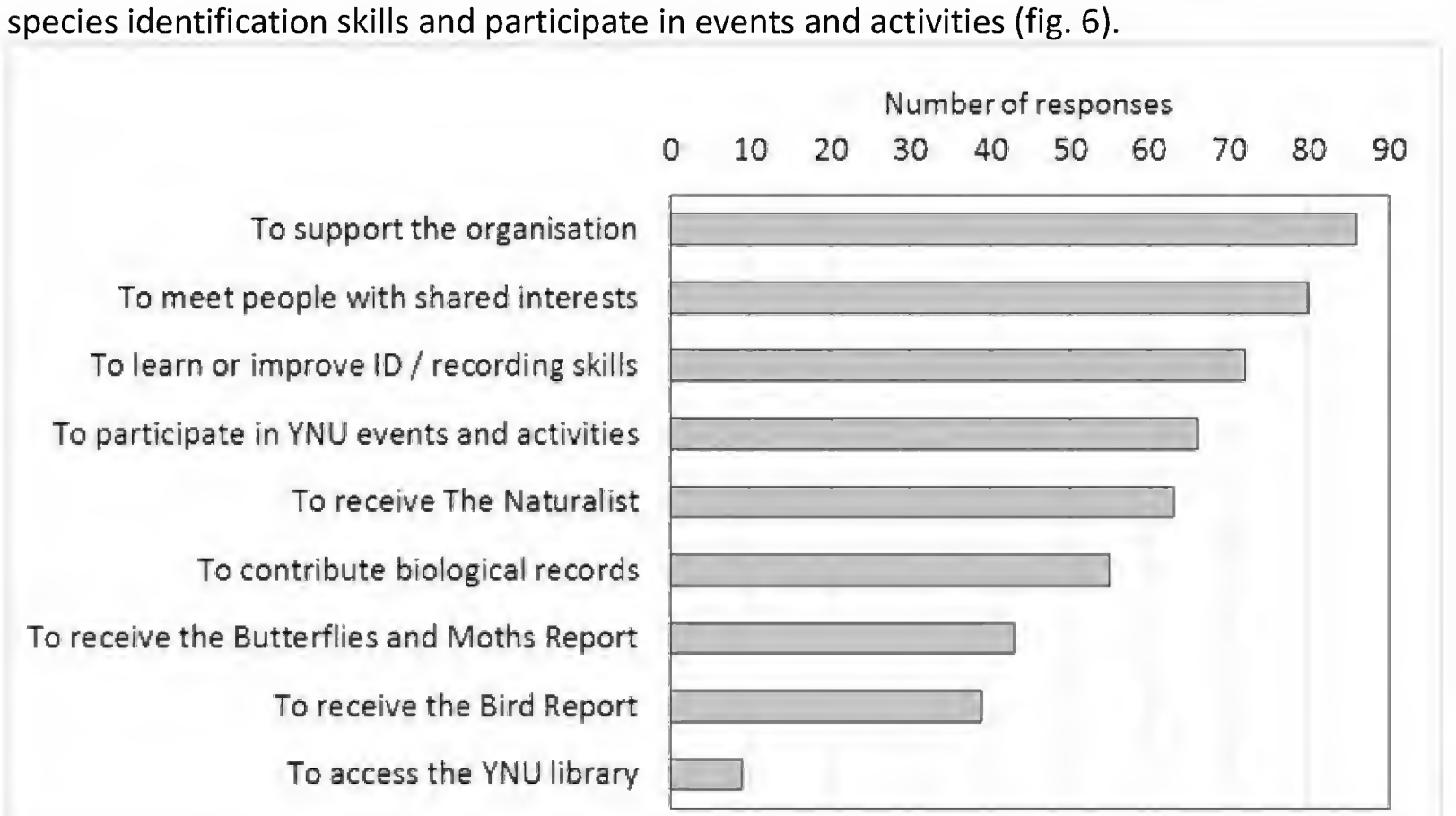

Figure 6: Respondents' reasons for joining the YNU (respondents could choose more than one option).

7% of respondents said their aims in joining the YNU had not been fulfilled and 22% said they had been only partly fulfilled. The main reason stated was lack of time to participate and benefit fully from membership, with comments such as "Not enough time to take part in a wider range of interest groups, and thus meet more of the membership", "My work schedule doesn't allow me to participate in field meetings, writing articles, submitting records etc", and "Due to young family, not able to get out on field visits." Other common reasons stated for not benefiting from YNU membership were that there were insufficient training events and that field meetings were too far away or not very welcoming to new or inexperienced members. Several respondents commented that they had joined very recently and therefore had not yet had a chance to benefit fully by participating in events and activities. 13% of respondents live outside Yorkshire.

The YNU cannot change the hectic pace of modern life, but perhaps we could do more to help members balance their natural history interests with their work and family commitments. Perhaps it would be helpful if we offered some field meetings closer to urban/populated areas and accessible by public transport and organised 'after work' field meetings on long summer evenings where appropriate for the taxonomic group. These types of meetings might be suitable for a greater emphasis on training beginners rather than just focusing on recording. It might also be beneficial to highlight field meetings that would be suitable for bringing young family members? We welcome your suggestions!

81% of respondents had attended at least one type of YNU event. Table 1 shows the proportion of respondents who had attended each type of event and how those who had attended rated them:

Table 1: Respondents' attendance and rating of YNU events

	Several times	Once	Never	Excellent	Good	Fair	Poor
Conference	37%	17%	45%	29%	56%	15%	0%
AGM	30%	14%	56%	10%	61%	29%	0%
Public events e.g. Bioblitz	9%	19%	72%	29%	58%	10%	3%
VC excursions	41%	11%	47%	28%	60%	10%	2%
Field meetings	35%	7%	58%	40%	52%	8%	0%
Training events	13%	14%	73%	50%	50%	0%	0%

To the question "Are there any additional types of events and activities you would like the YNU to deliver", 57 respondents said they would like field meetings designed as training events, 28 said they would like evening talks on natural history and 17 said they would like an annual social event such as a dinner. Other suggestions included an annual bird lecture, field meetings focussing on bees and wasps, a forum for species identification assistance and more bioblitzes. More importantly, 22 respondents would be willing to help deliver such events.

This is the crux of the matter. The survey generated lots of excellent suggestions for how the YNU can maintain and improve our support for the study of Yorkshire's natural history, but

these suggestions rely on active participation by members to deliver them. It was extremely heartening to learn via the survey that over 60% of current members would be interested in contributing to the YNU in an area where they have not previously been involved.

For example, 38 members said they would be interested in helping to verify records received via the YNU's online recording system, which would be extremely useful for improving data flow and recorder motivation. 29 said they would consider writing articles for *The Naturalist* or other YNU publications, which would certainly be very much appreciated. 25 said they could deliver training in species identification and 19 said they could organise field meetings, which is particularly important as this survey found that many members would like the YNU to provide more training opportunities, both formal and informal.

10 people said they would consider helping to organise a YNU conference, while 17 said they would be interested in speaking, chairing or offering a poster at a conference. This is excellent news, as the YNU conference is one of our most important events for achieving our charitable objectives and bringing the membership together. Other offers of help included sharing news and photographs about Yorkshire's natural history and YNU events via the YNU's social media channels and website, which would be very helpful for raising our profile and helping us to reach a wider audience.

This was an extremely positive outcome of the survey and the relevant YNU officers will follow up with members who expressed an interest in these areas over the coming months. If you didn't complete the survey but would be interested in participating more actively in the YNU, the authors would be delighted to hear from you!

<u>Affiliated Societies</u>

The YNU has over 40 affiliated societies, some of whom support natural history or conservation in a particular geographic area, such as the Whitby Naturalists' Club, while others also have a taxonomic focus such as Butterfly Conservation Yorkshire. 70% of individual respondents were also members of at least one of the YNU's affiliated societies. Of the 18 affiliated societies who responded to the survey, seven were formed in the late 19th century around the same time as the YNU, while five were formed in the early 20th century and six in the late 20th century. Ten societies had fewer than 100 members, six had between 100-500 members and two had between 500 and a thousand members.

Societies were asked how they currently benefit from affiliation to the YNU and how they would like to benefit in future. The main way they already benefit was through organising joint field meetings, and the main additional ways they would like to benefit were by having YNU speakers for their lecture programme, their events advertised on the YNU website and social media and their society journal archived at the YNU library (fig. 7).Only thirteen of the societies who responded said they engaged with the YNU in some way to ensure it met the needs of their members. Most did this by communicating regularly with a YNU Section Head or Recorder and/or by attending the YNU AGM and Natural Science Forum Meetings. Only fourteen said they communicated with their members about the YNU; the majority of those said they promoted the YNU's conference to their members, encouraged members to attend YNU field meetings and had a link to the YNU's website from their website.

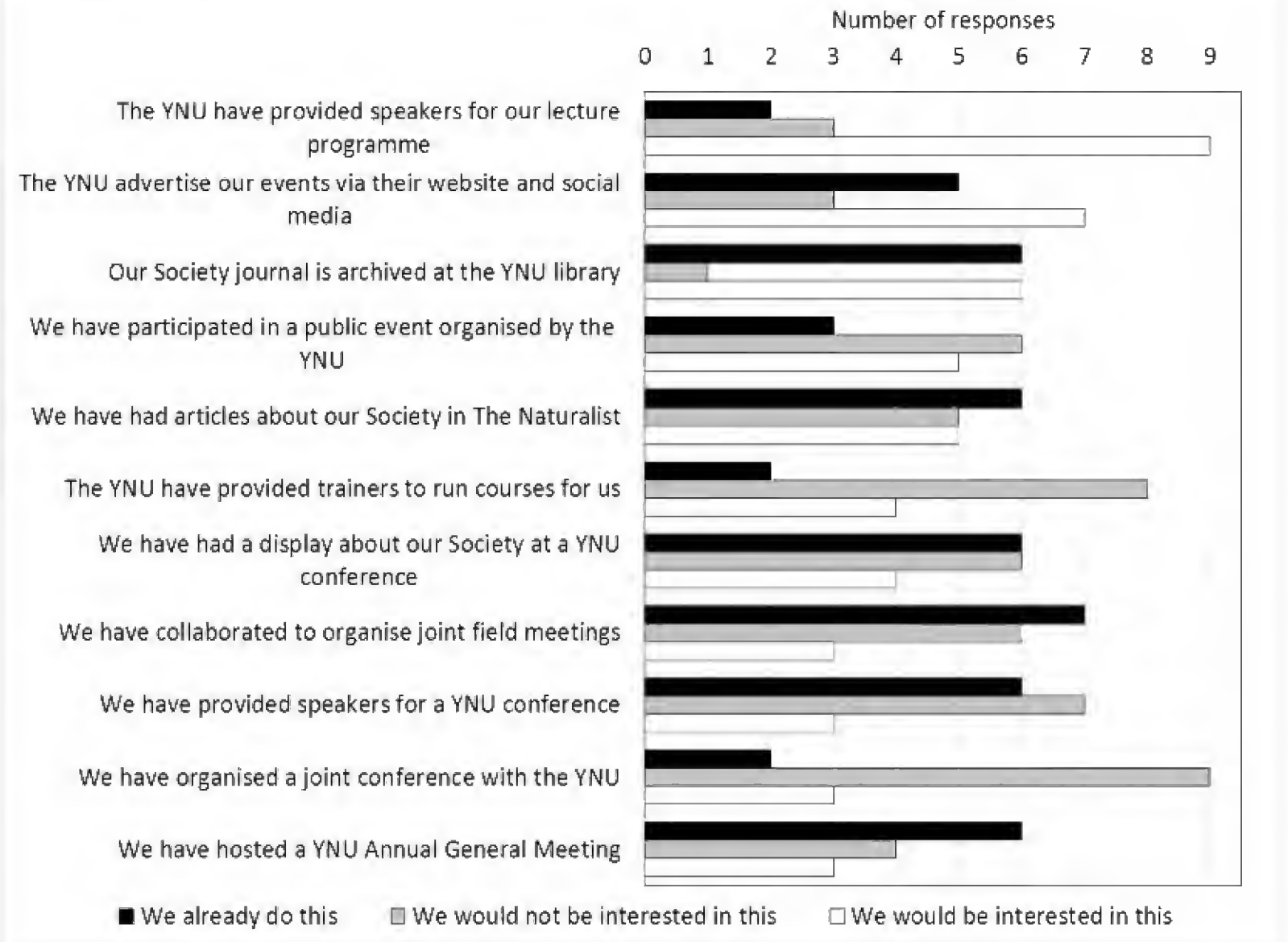

Figure 7: How affiliated societies benefit from affiliation to the YNU.

Several individual members expressed concerns about relationships between the YNU and our affiliated societies, making comments such as "Need to re-establish links with affiliated societies" and "Are our mutual interactions with affiliated societies as strong as they could be?"

The societies themselves expressed desire for better communication: "Make sure all affiliated societies are in regular communication with YNU (via a Liaison Co-ordinator?) so that e-mail addresses and other contact details are up-to-date, promoting events both ways, gentle encouragement from YNU Co-ordinator for societies to nominate people to attend conferences, etc."

The YNU is very keen to appoint an Affiliated Societies Liaison Officer to ensure that societies and their members benefit fully from affiliation to the YNU, and that the YNU benefits in turn through greater engagement of affiliated society members in its activities. The role need not be very time-consuming, support would be provided and it would be a great opportunity to make a real difference to the YNU and to support natural history in the region. Please contact the authors if you would be interested in discussing this role.

Final comments

This is just a summary of some key points arising from the survey – there is a great deal more information that can be extracted from the raw data and we will be looking at this in detail over the coming months. This has been an extremely worthwhile exercise. If we act on these findings, we can build on our achievements, strengthen links with affiliated societies and support new members so we can continue to be, in one respondent's words "a much needed centre of excellence" in Yorkshire natural history.

It is important to note that the survey was only sent to members for whom we have an e-mail address. Prior to the survey, efforts were made to obtain e-mail addresses for all members, which resulted in around a hundred additional e-mail addresses being added to the membership database, but there are still several members for whom we do not have an e-mail address and their views are not represented by this survey.

All respondents were entered into a prize draw for a £50 NHBS voucher. The winner was YNU member Steven Heathcote from Goole – congratulations Steven!

The YNU are very grateful to Matt Davies of MaPlanGo for his help in designing and delivering this survey.

References:

Pickles, S. and Millington, M. (2015) Inclusion of biological records and related information in local decision making. *The Naturalist* 140 (1090): 187-189

Opportunities at the Yorkshire Naturalists' Union

The Yorkshire Naturalists' Union has been supporting the study and enjoyment of natural history for over 150 years. We undertook the membership survey because we wish to ensure that we are welcoming to new naturalists and responsive to changes in the way people engage with, study and record nature, while maintaining and improving services to our existing membership.

We are keen to build on the findings and implement recommendations from the survey, but we need your help! The YNU is run on a voluntary basis by members for members. We would love to hear from enthusiastic people who would like to be part of our team as we take this important work forward. There are many and varied roles within the YNU, but key areas where we would welcome input from members with relevant interests, skills and experience include:

- ☐☐ Membership communications
- ☐☐ Affiliated Society support
- ☐☐ Website and social media
- ☐☐ Editorial support for publications
- ☐☐ Event organisation
- ☐☐ Database administration
- ☐☐ Biological recording and data flow
- ☐☐ Education and training

If you might be interested in getting more involved in the YNU and would like to discuss opportunities, contact Paula Lightfoot on p.lightfoot@btinternet.com or 01912 083055. All expenses will be covered and equipment provided where necessary. In certain circumstances, a modest salary can be provided, e.g. for unwaged or student applicants.

YNU Calendar

Up-to-date information can also be found on the Events page of the YNU website.

Aug	4	Entomological Section Field Meeting at Three Hagges Jubilee Wood, Escrick. Meet at 10.30 at the gate to the wood in Escrick SE627394. Car parking is available.
	20	**VC64 Field Excursion** Ingleborough Nature Reserve SD772778. Meet at 10.30 at Colt Park Barn SD772778. See *The Naturalist* 1091 p76 for full details.
	21	Marine and Coastal Section field trip to Sandsend. Low water 0.5 metres at 13.00 Meet at 11.00 in the car park next to Wits End café NZ860129.
Sep	1	Entomological Section Field Meeting at Three Hagges Jubilee Wood, Escrick. Meet at 10.30 at the gate to the wood SE627394 in Escrick. Car parking is available.
	7	Plant Gall Section Field Meeting at Ox Close Wood nr East Keswick. Meet at 10.30 in the car park just off the A659 at SE363453.
	11	British Plant Gall Society Field Meeting at Anglers Country Park, near Wakefield. Meet at 10:30 am in the Visitor Centre car park at SE373153. Please bring a packed lunch. The Centre has a cafe and toilet facilities.
	11	Conchological Field excursion Carnaby, nr Bridlington (VC61). Meet at 10.30 on Church Lane near the church at TA14576550 .
	17	Freshwater Ecology Section Field Meeting at Ribblehead Quarry. Meet at 10.30 in the car park at SD766788 up the track on the south side of the B6255 just to the west of the railway bridge. A joint meeting with Craven Conservation Group.
	18	Marine and Coastal Section meeting at South Bay, Scarborough. Meet at 10.00 in Holbeck car park in South Bay TA049868. Low water 0.5 metres at 12.00 noon.
Oct	8	Bryology Section Field Excursion to Caseker Gill near Kettlewell (VC 64). Meet at 10.00 in the main car park at Kettlewell SD967722.
	29	Conchological section AGM at 17 West Park Drive, Leeds, LS16, starting at 1:00.
Nov	5	**YNU AGM and Natural Sciences Forum** meeting at Fountains Abbey. See p120 for details.

Yorkshire Naturalists' Union

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The Naturalist

This publication is issued free to individual members of the Yorkshire Naturalists' Union and to Affiliated Societies. The Editorial Board of *The Naturalist* is currently:

J. Bowers, W. Ely, A. Henderson, A. Millard, P. Simmons, D.Smith

Notice to contributors

Contributors should indicate whether they wish their manuscripts to be subjected to anonymous peer review. All other manuscripts will be reviewed by the Editorial Board who at their discretion may send them to third parties for comment and advice.

Please note change of email address for submission of articles, which should now be sent as an MS Word document to Dr A. Millard at **editor@ynu.org.uk**

Please look at a recent issue of the journal for a general idea of how to present your article. Also see *The Naturalist Guide to Consistency* on p77 of The Naturalist 1079 and please **avoid** the following:

- using any paragraph formatting and line spacings other than single.
- using tabs to tabulate information (please use MS Word table format).
- inserting any figures, graphs or plates into the text; indicate their proposed locations in the text and send them as separate files.

Good quality, high resolution images are very welcome and should be sent as .jpg files, with a separate MS Word file containing the caption and name of the person to whom the image should be attributed.

If electronic submission is not possible, contributions should be sent to Dr. A. Millard, Woodland Villas, 86 Bachelor Lane, Horsforth, Leeds LS18 5NF (Tel. 0113 258 2482).

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